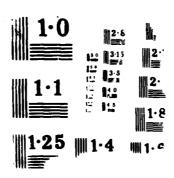
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INSTALLATION RESTORATION PROGRAM PHASE II - CONFIRMATION/QUANTIFICATION

STAGE 3

FINAL REPORT FOR

MATHER AIR FORCE BASE, SACRAMENTO, CALIFORNIA

AEROVIRONMENT INC. 825 MYRTLE AVENUE MONROVIA, CALIFORNIA 91016

JANUARY 1988 FINAL REPORT (JULY 1986 TO FEBRUARY 1988)

APPROVED FOR PUBLIC RELEASE DISTRIBUTION UNLIMITED

PREPARED FOR

HEADQUARTERS AIR TRAINING COMMAND COMMAND SURGEON'S OFFICE (HQATC/SGPB) BIOENVIRONMENTAL ENGINEERING DIVISION RANDOLPH AFB, TEXAS 78150-5001



UNITED STATES AIR FORCE OCCUPATIONAL AND ENVIRONMENTAL HEALTH LABORATORY (USAFOEHL) TECHNICAL SERVICES DIVISION (TS) BROOKS AIR FORCE BASE, TEXAS 78235-3501

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FEBRUARY 1988

PREPARED BY

AEROVIRONMENT INC. 825 MYRTLE AVENUE MONROVIA, CALIFORNIA 91016

USAF CONTRACT NO. F33615-83-D4000, DELIVERY ORDER No. 12
AEROVIRONMENT PROJECT NO. 10416L

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CAPTAIN DAVID GIBSON
USAFOEHL TECHNICAL PROGRAM MANAGER

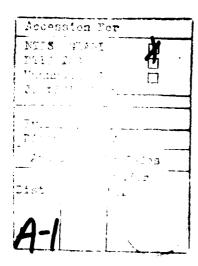
UNITED STATES AIR FORCE
OCCUPATIONAL AND ENVIRONMENTAL HEALTH LABORATORY (USAFOEHL)
TECHNICAL SERVICES DIVISION (TS)
BROOKS AIR FORCE BASE, TEXAS 78235-5501

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PREFACE

This report was prepared by AeroVironment Inc. under task order 12 of contract F33615-83-D-4000. This report is a summary of field activities, data, analysis, conclusions and recommendations prepared as part of the Phase II, Stage 3 IRP investigation of Mather AFB.

The project team primarily consisted of Mr. Douglas Taylor, Mr. Timothy O'Gara, Mr. Christopher Lovdahl, Mr. Kenneth Napp, Mr. David Herrera, Ms. Sandra Eccker and Ms. Sheryl Thurston of AeroVironment Inc. Mr. Taylor served as project manager, Mr. O'Gara and Mr. Napp served as field geologists, Mr. Lovdahl and Ms. Eccker provided laboratory coordination, and Ms. Thurston and Mr. Herrera assisted with drilling and sampling.

AeroVironment wishes to acknowledge the assistance of Mather AFB personnel, particularly Capt. James Curran, and MSgt. Patricia Sparks of the Bioenvironmental Engineering office. Also, the Phase I report prepared by CH2M Hill, the Phase II, Stage I report prepared by Roy F. Weston, and the Phase II, Stage 2 report prepared by AeroVironment were used as information sources throughout this project.

This work was accomplished between July 1986 and March 1987. Capt. Brian D. McCarty, Technical Services Division, USAF Occupational Environmental Health Laboratory (USAFOEHL) was the technical monitor.

Approved:

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Vice President, Environmental Programs Division

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Project Manager

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EXECUTIVE SUMMARY

The United States Air Force has developed the Installation Restoration Program to assess the environmental effects of past hazardous material handling and disposal activities. As part of that program, the Air Force assigned Task Order Number 12 to AeroVironment Inc., under contract F33615-83-D-4000, to conduct a Phase II, Stage 3 study of Mather AFB, California. Mather is located about 15 miles east of downtown Sacramento, in Rancho Cordova, California.

A Phase II study, using a staged approach, is intended to confirm the information reported in the Phase I report (a record search) and to quantify the presence and extent of contamination that may be present. In 1984, Roy F. Weston Inc. completed a Phase II, Stage 1 study of the three most serious sites at Mather AFB:

- Site No. 7, 7100 Disposal Area
- Site No. 12, Air Command & Warning (ACW)
- Site No. 15, West Ditch

The Stage 1 report recommended that the sites be investigated further to fully define the groundwater contamination that had been either confirmed or suspected at each site. AeroVironment conducted the Stage 3 effort (a Stage 2 study was conducted on other sites in 1985) to define the contamination at these sites in three dimensions. Upgradient (background) conditions along the Northeast Perimeter of the base were also investigated.

History of Sites

The 7100 Disposal Area is located in the southwestern section of the base, south of the now-abandoned sewage treatment plant. The site was originally a borrow pit, excavated in 1953 to a depth of 40 feet. From 1953 to 1966,

the site was a major disposal area for POL wastes from the industrial shops, which may have contained TCE. Disposal of industrial wastes (except POL) continued through 1975. Since 1975, construction rubble has been disposed of in this area.

The Air Command and Warning (ACW) Disposal Area is located northeast of base housing and southeast of the SAC alert apron. From 1960 until 1966 it was reportedly common practice for personnel at the ACW radar site to dispose of waste solvents and oils into a waste disposal pipe located about 100 feet southwest of the ACW production well. The Phase I report estimated that 1350 gallons of TCE and 1225 gallons of waste transformer oil had been disposed of in the pipe from 1960 to 1966.

The West Ditch flows from north to south along the western edge of the base. This unlined drainage ditch receives storm drainage from the entire main base, including the ATC and SAC shop areas. A skimmer was installed along the ditch in 1967. In the past, waste oils and solvents were reportedly dumped directly into the skimmer, which overflowed into the ditch. These wastes may have included TCE.

The Northeast Perimeter of Mather AFB is upgradient relative to the natural regional groundwater flow. Contamination carried in groundwater onto Mather AFB from adjacent properties would probably enter the base from this direction.

Testing Conducted

In particular, AeroVironment drilled, installed and sampled 36 groundwater monitoring wells at the three sites plus the Northeast Perimeter. Wells were drilled into two aquifers, the water table aquifer and the first confined aquifer. At the ACW Site and 7100 Area, AV conducted a soil gas survey to try to detect TCE in the surface soil or in a plume in the groundwater. Geophysical surveys were conducted at the ACW site and 7100 area.

AeroVironment and its geophysical and soil gas subcontractors performed testing at the 7100 Disposal Area and the ACW Disposal site during August and September of 1986. Drilling began in August 14, 1986, and was completed on October 12, 1986. At least one AeroVironment geologist was on site during all drilling activities.

Two complete sets of groundwater samples were collected from each of the 35 wells installed in this program, plus 1 well from Stage 2 and 8 wells from Stage 1. One round of sampling was collected from 10 base production wells. The samples were collected in November and December 1986. The December sampling also included all functional base production wells. Table ES-1 summarizes the work completed during this project.

Summary of Results

Soil gas testing and geophysical surveys at the ACW Disposal Site identified neither a suspect source location nor a contaminant plume. As a result, well locations were selected based on groundwater gradients only.

Geophysical surveys at the 7100 Disposal Area indicated a possible plume of inorganic contamination in the shallow groundwater, so downgradient wells were located to monitor conditions along the suspected leading edge of the plume. The limited soil gas survey southwest of this site did not identify any shallow soil contamination. Groundwater flow at both locations is from northeast to southwest.

Water samples were analyzed for the parameters shown in Table ES-1. Ten volatile organic compounds were identified in the samples. The most prevalent, trichloroethene (TCE), was found in nine of the wells at concentrations that exceed the California Department of Health Services (DOHS) Action Level. Tetrachloroethene (also known as perchloroethylene, PCE), benzene, vinyl chloride, 1,2-dichloroethane and 1,4-dichlorobenzene were also found at levels that exceed the action level. Xylene was also found at significant levels in one sample, but not above action levels. Significant concentrations are those that were repeated in both sample sets and that occurred in concentrations greater than the limit of quantitation (LOQ) which is defined as five times the method detection limit. The

TABLE ES-1. Mather AFB Phase II, Stage 3 Work Summary

Site	Stage 3 Drilling	Stage 3 Sampling	Stage 3 Additional Work	Previous Stage 1 Activity
ACW Disposal Site (1960-1966)	Drilled and installed 11 groundwater monitoring wells; 5 shallow and	Sampled 14 wells twice (11 Stage 3, 3 Stage 1) Analyzed for VOCs, ions,	Conducted a magnetometer and ground penetrating radar survey to locate the disposal pipe	3 shallow wells
	deep o	and minerais	Conducted a soil gas survey to help define the extent of the TCE plume at this site	
7100 Disposal Area (1953-1975)	Drilled and installed 12 groundwater monitoring wells; 7 shallow and 5 deep	Sampled 15 wells twice (12 Stage 3, 3 Stage 1) Analyzed for: VOCs, ions, minerals, metals, and cyanide	Conducted an electrical conductivity survey to help define plume of contaminated groundwater	3 shallow wells
West Ditch Area (1967-?)	Drilled and installed 7 groundwater monitoring wells; 3 shallow and 4 deep	Sampled 9 wells twice (7 Stage 3, 2 Stage 1) Analyzed for: VOCs, ions, and minerals		2 shallow wells
Northeas: Perimeter	Drilled and installed 5 groundwater inonitoring wells; 2 shallow and 3 deep*	Sampled 6 wells twice (5 Stage 3, 1 Stage 2) Analyzed for VOCs, ions, and minerals		3 shallow wells
Base Produc- tion Wells		Sampled 10 wells once Analyzed for VOCs, ions, and minerals		

One shallow and one deep well (wells 46 and 59) listed for this area were installed near the Jet Engine Test Cell. *A third shallow well was drilled as part of Stage 2, but was sampled and reported as part of Stage 3. 20ne shallow well listed for this area was installed upgradient near the commissary.

exception to this definition is made when a sample has been found over the DOHS action level. If that occurs, the result is considered significant even if it is not repeatable or over the LOQ.

Ten shallow and five deep wells were sampled at the 7100 disposal area. Five of the downgradient shallow monitoring wells contained significant concentrations of volatile organics, particularly TCE. Three of the aforementioned wells with significant contamination of volatile organics are located off base property in and around the gravel pits west of the site. In fact, the off-base wells, which are located about 1000 ft downgradient from the site, had higher concentrations of organics than on-base wells located at the edge of the site. This indicates that the current set of downgradient wells was not near the leading edge of the contaminant plume. There appeared to be no spread of contamination into the second aquifer. All three upgradient wells were free of contamination.

Eight shallow wells and six deep wells were sampled at the ACW area. Four of the downgradient shallow monitoring wells were found to contain significant concentrations of TCE. The three Stage I wells, which are located near the suspected source, contained 23 to 790 µg/L of TCE (the DOHS action level is 5 µg/L). These results were higher than those from the 1985 study. One shallow well 2000 ft downgradient from the site contained about 5 µg/L, a 5 to 150-fold decrease in concentration. This indicates that the leading edge of the plume was probably not much further than 2000 ft from the site. There was no indication that the TCE contamination in the first aquifer was migrating downward into the second aquifer. Base production wells located downgradient from the site (in the base housing area) were free of TCE. Both upgradient wells were also free of contamination.

Five shallow wells and four deep wells were sampled at the West Ditch. One of the shallow wells located adjacent to the skimmer at the south end of the ditch contained significant levels of TCE and PCE. The northernmost deep well also contained significant levels of TCE and PCE. Concentrations from this deep well were repeatable between sampling rounds and are considered reliable. These results appear unrelated, since the wells adjacent to these contaminated wells

do not show evidence of TCE or PCE. No directly upgradient wells exist and only off-base domestic wells exist downgradient. As a result, insufficient information has yet been gathered about the extent of contamination, only that it exists.

None of the six wells sampled along the Northeast Perimeter contained any evidence of contamination.

The base production wells were also free of contamination, with the exception of the inactive ACW well (which was known to be contaminated) and IIW-01, which showed a low level of 1,2-dichloroethane. Because only one round of samples was collected from production wells, the result of HW-01 could not be confirmed. Since Air Force sampling has never identified this compound in HW-01 before, and since split samples collected by the Mather Bioenvironmental Engineer at the time of the AV sampling showed no detectable 1,2-dichloroethane in HW-01, this result was believed to be a laboratory error.

Two deep wells at ACW contained significant concentrations of benzene and/or other aromatic compounds. However, since these results were not repeatable between rounds and were at very low concentrations, we suspect them to be laboratory or sampling error.

Generally speaking, the results of the Stage 3 sampling were comparable to those of Stage 1. The Stage 3 results confirmed the contamination previously identified or suspected and better defined the extent of plume migration at ACW and 7100.

Recommendations

Table ES-2 summarizes specific recommendations. No problems exist along the Northeast Perimeter and only continued monitoring is necessary in that area of the base. Three additional shallow wells are needed downgradient (off base) from the existing well network at both the 7100 Disposal Area and the ACW Disposal Site to determine the downstream extent of contamination. At the West Ditch, three downgradient and one upgradient shallow wells are needed to define the extent of movement. In addition, extensive research should be conducted on domestic wells along Happy Lane which have reportedly been contaminated with TCE.

TABLE ES-2. Summary of recommendations.

Site	Recommendation
Northeast Perimeter (Category II)*	 Continue monitoring upgradient conditions by sampling the 6 existing wells semiannually and test for VOAs (Method 601).
	- Abandon monitoring Well MAFB-5.
No. 7, 7100 Disposal Area (Category II)	 Install 3 additional groundwater monitoring wells, each in the water table aquifer and each downgradient from the existing wells (the new wells would be off base).
	- Sample the 15 existing wells plus the 3 new ones semiannually and test for VOAs (Methods 601 and 602), metals and minerals (Method 200).
No. 12, ACW Disposal Site (Category II)	 Install 3 additional groundwater monitoring wells, each in the water table aquifer and each downgradient from the existing wells.
	 Sample the 14 existing wells plus the 3 new ones semiannually and test for VOAs (Method 601). In addition, test samples from deep wells for Method 602 compounds at least once more.
No. 15, West Ditch (Category II)	 Install 4 additional groundwater monitoring wells, each in the water table aquifer. One well would be located upgradient of the west ditch skimmer and 3 would be downgradient (off base), west of Happy Lane.
	 Sample the 9 existing wells plus the four new ones semiannually and test for VOAs (Method 601/602).
	 Research all private wells within 1.0 mile of the site.

^{*}Category II is defined on Page VI-1.

I. INTRODUCTION

A. Purpose of the Program

The United States Air Force (USAF) has developed the Installation Restoration Program (IRP) to identify and evaluate environmental contamination from past handling and disposal of hazardous materials at Air Force bases throughout the United States. AeroVironment Inc. (AV) was retained by the U.S. Air Force Occupational and Environmental Health Laboratory (USAFCEHL) to provide consulting services for the IRP under Contract F33615-83-D-4000. Under that contract, AV was tasked to conduct a Phase II, Stage 3 investigation of Mather AFB, California, for Headquarters Air Training Command (HQ ATC).

In the Phase I record search, CH2M Hill identified 23 sites at Mather AFB as possible or known hazardous waste disposal sites. Of these 23 sites, 29 were ranked using the hazard assessment rating methodology (HARM). The Phase I report recommended that the three highest ranked sites be investigated further in Phase II, Stage 1 (CH2M Hill, 1982). They are, in order of decreasing order of HARM ranking:

Site 7 7100 Disposal Area

Site 12 Air Command and Warning (ACW) Disposal Site

Site 15 West Ditch (Drainage Ditch No. 3)

In addition, the Northeast Perimeter of Mather AFB was to be studied to determine upgradient conditions.

The Phase II, Stage 1 survey was conducted in 1984 by Roy F. Weston Inc. The results of the Stage 1 sampling showed that groundwater contamination exists or may exist at all three sites. Weston recommended further study at each site to define the extent of the problem.

During the Phase II, Stage 1 survey, HQ ATC decided that in addition to the 3 sites being investigated by Weston, 15 of the remaining 17 HARM-ranked sites should also be investigated. AV studied these sites under a Phase II, Stage 2 survey in 1985/1986.

In accordance with the recommendation by Weston, AV conducted a Phase II, Stage 3 investigation of the 3 sites studied under Stage 1 and of the Northeast Perimeter as well. The objectives stated in the task order were:

- (1) To determine the presence or absence of contamination within the specified areas of investigation.
- (2) If contamination exists, to determine the potential for the contaminants to migrate through the various environmental media.
- (3) To identify additional investigations necessary to determine the magnitude, extent, direction and rate of migration of discovered contaminants.
- (4) To identify potential environmental consequences and health risks of migrating pollutants.

To meet these objectives, AV installed and sampled 35* groundwater monitoring wells at the 4 sites. At two of the sites, AV conducted an electromagnetic profiling survey to explore for conductive subsurface zones that might be associated with contaminant migration. In additional surveys using ground-penetrating radar, magnetometer and pipe locator, we attempted to locate a buried pipe used for halogenated solvent disposal at the ACW site. In addition, a shallow soil gas survey at two of the sites delineated the distribution of solvents in the subsurface. Table I-1 summarizes the work performed at each of these sites.

^{*}One additional well was drilled with funds from another task order, but will be discussed in this report because it is part of the Northeast Perimeter monitoring system.

Table I-1. Mather AFB Phase II, Stage 3 Work Summary

Site	Stage 3 Drilling	Stage 3 Sampling	Stage 3 Additional Work	Previous Stage 1 Activity
ACW Disposal Site (1960-1966)	Drilled and installed 11 groundwater monitoring wells; 5 shallow and 6 deen	Sampled 14 wells twice (11 Stage 3, 3 Stage 1) Analyzed for VOCs, ions,	Conducted a magnetometer and ground penetrating radar survey to locate the disposal pipe	3 shallow wells
			Conducted a soil gas survey to help define the extent of the TCE plume at this site	
7100 Disposal Area (1953-1966)	Drilled and installed 12 groundwater inonitoring wells; 7 shallow and 5 deep	Sampled 15 wells twice (12 Stage 3, 3 Stage 1) Analyzed for: VOCs, ions, minerals, metals, and cynnide	Conducted an electrical conductivity survey to help define plume of contaminated groundwater	3 shallow wells
West Ditch Area (1967-?)	Drilled and installed 7 groundwater inonitoring wells; 3 shallow and 4 deep	Sampled 9 wells twice (7 Stage 3, 2 Stage 1) Analyzed for: VOCs, ions, and minerals		2 shallow wells
Northest Perimeter	Drilled and installed 5 groundwater monitoring wells; 2 shallow and 3 deep*	Sampled 6 wells twice (5 Stage 3, 1 Stage 2) Analyzed for VOCs, ions, and ininerals		3 shallow wells
Base Produc- tion Wells		Sampled 10 wells once Analyzed for VOCs, ions, and ininerals		

^{*}A third shallow well was drilled as part of Stage 2, but was sampled and reported as part of Stage 3.

20ne shallow well listed for this area was installed upgradient near the commissary.

One shallow and one deep well (wells 46 and 59) listed for this area were installed near the Jet Engine Test Cell.

AV completed the work specified in the project's statement of work (SOW) and accomplished the objectives to the maximum extent possible. All of the groundwater monitoring wells were installed and sampled; however, some of the base's production wells could not be sampled because the pumps were inoperative at the time of the sampling. Soil sampling was not undertaken because soil gas monitoring did not locate an area of contamination. The results of the sample analyses, which are discussed in Chapter IV, have helped us determine which sites at Mather AFB show evidence of contamination.

B. <u>Duration of the Program</u>

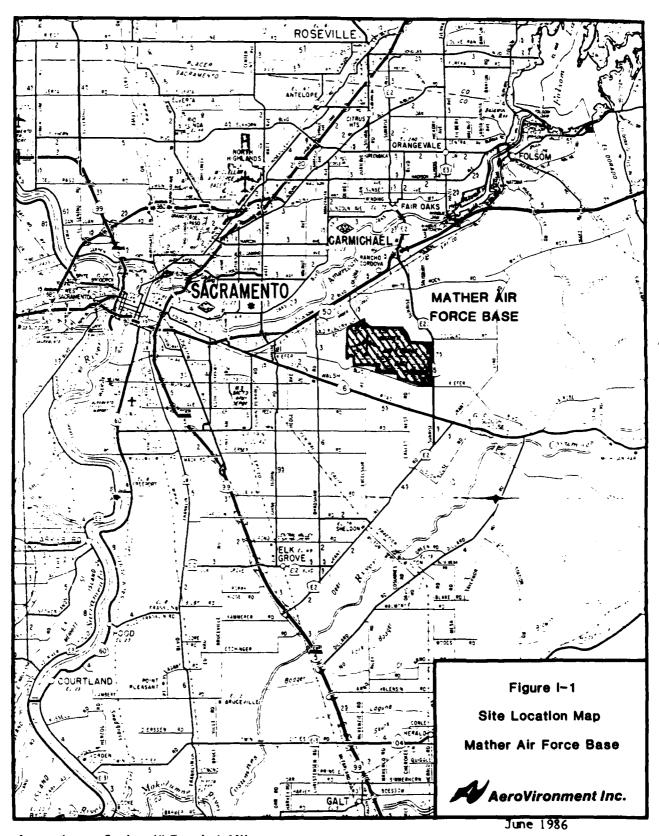
On August 15, 1986, AV received Task Order No. 12 of Contract F33615-83-D-4000 to conduct the Phase II, Stage 3 survey at Mather AFB (verbal authorization had been received on July 17, 1986).

AV negotiated a drilling subcontract and received bids for other subcontract items before the formal award of the contract. When we received verbal authorization from the Air Force, we formalized the subcontracts, submitted our safety plan to the California Department of Health Services, completed the Technical Operations Plan for USAFOEHL, and planned the logistics for beginning field work. Well drilling began on August 14, 1986, and ended on October 12, 1986. Geophysical surveys were conducted August 18-22, 1986. The soil gas survey was conducted September 2-6, 1986. Groundwater samples were collected at Mather AFB in two rounds: November 9-17, 1986 and December 8-14, 1986. The latter included base production wells.

All field work at Mather AFB was completed by December 14, 1986. All laboratory analyses were completed by January 23, 1987. Report preparation began after the well drilling ended. This document reports the findings, tasks and impact analysis of this investigation.

C. Base History

Mather Air Force Base (see Figures I-1 and I-2) was constructed in 1918 and served as a flight training school until June 1922 when it was inactivated. For



Approximate Scale: 1" Equals 4 Miles
Reference: Sacramento Valley Region Map
California State Automobile Association

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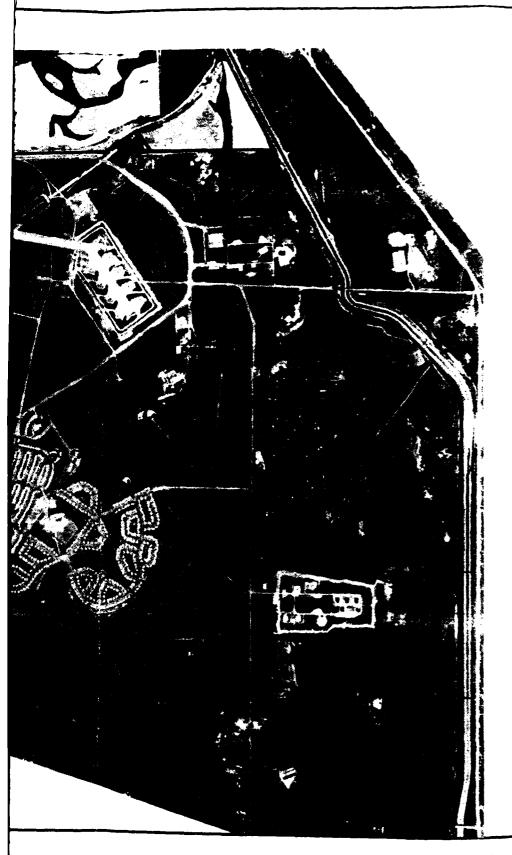




Figure I-2
Base Photo
Mather Air Force Base

AeroVironment Inc.

a period between March 1930 and November 1932, Mather was reactivated, but it was not involved in continuous military activity until World War II, when it officially resumed its training mission. In 1945 a school was established for navigator-bombardiers. This school has since been expanded to train all services under the Department of Defense. In 1958, Strategic Air Command assigned the 4134th Strategic Wing to Mather as a tenant organization. This wing was replaced by the current tenant organization, the 320th Bombardment Wing, in February 1963.

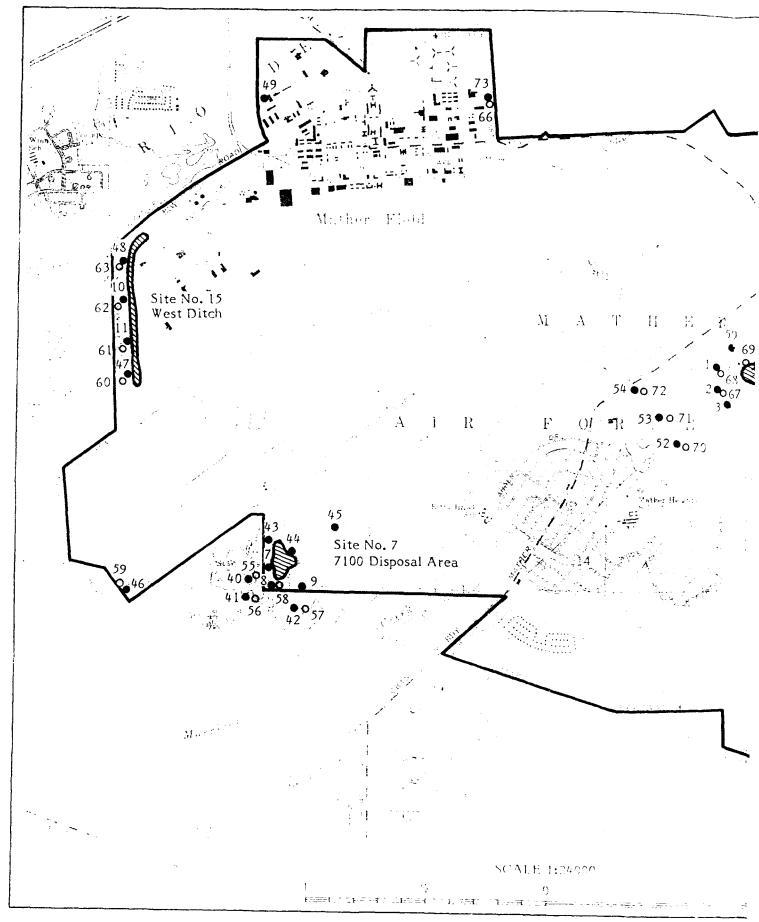
A description of the sites AV investigated for possible contaminants follows. Most of the information presented in this section has been taken from the Phase I records search (CH2M Hill, 1982) and the Phase II, Stage 1 survey report (Weston, 1986). Figure I-3 shows the general location of these sites; the exact locations will be presented in Chapter 4.

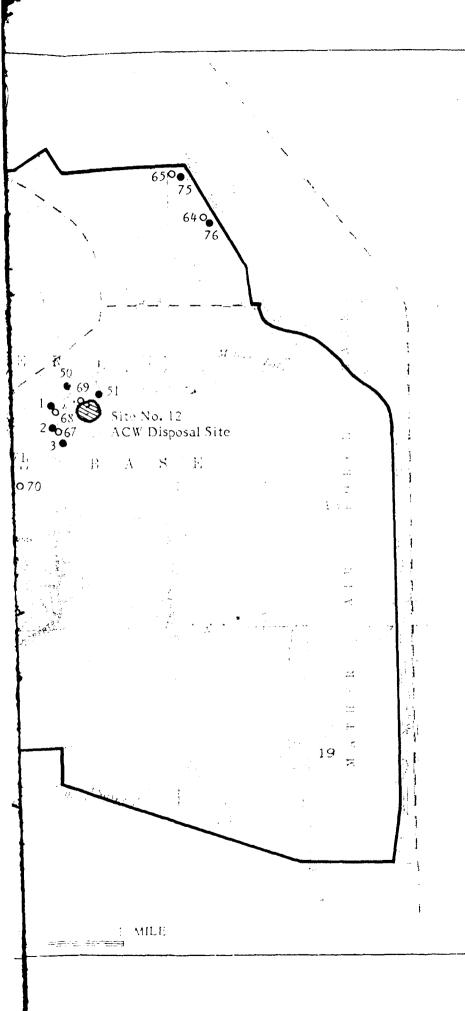
- 7100 Disposal Area (Site 7)

The 7100 Disposal Area is located in the southwestern section of the base, south of the now-abandoned sewage treatment plant (STP). It is bounded immediately to the north by the current (1958-1984) Fire Department Training Area (Site No. 11 in the Phase I report), to the east by the STP oxidation ponds, to the south and west by the base boundary.

The 7100 Area landfill was originally a borrow pit, excavated in 1953 for construction of the Strategic Air Command (SAC) area. The pit, originally about 40 feet deep, has been used since 1953 for waste disposal and has been completely filled with refuse.

The 7100 area was also known as the "nonburn dump" and the "construction rubble disposal site." It is currently used for disposal of inert construction rubble, but was reportedly used in the past for all types of wastes except household garbage, which was sent to the base sanitary landfills. From 1953 until about 1966, the landfill was a major disposal site for petroleum, oil and lubricant (POL) wastes, which were routinely transported from the industrial shops





- Shallow groundwater monitoring well
- O Deep groundwater monitoring well



IRP Sites

Note: Only Phase II, Stage 3 sites are shown.

Reference: USGS topo maps and USAF Master Plan for Mather AFB, 30 September 1983.



Figure 1-3

Base Map

Mather Air Force Base



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to this site for disposal. Trichloroethylene (TCE) was in common use during most of this time and may also have been disposed of at this site. The practice was curtailed in 1966 when an oily seepage was observed leaching into an adjacent borrow pit, which is located off base to the west and is excavated to approximately 40 feet below grade. Other wastes reportedly dumped in this site include empty drums, sludge from the plating shop dip tanks (approximately 80 gallons per year until 1975), adsorbent sand used in cleaning up oil and solvent spills, paint chips, waste paints and thinners, and transformer oil that may have contained polychlorinated biphenyl (PCB) compounds (at least one instance of such dumping is known). Disposal of industrial wastes at this site was discontinued in 1975.

- ACW Disposal Site (Site 12)

The Air Command and Warning Disposal (ACW) site is located in the ACW area, between the alert apron and family housing. The site was constructed in the late 1950's as part of the Air Defense Command early warning system. The 668th ACW Squadron, which operated the site jointly with the Federal Aviation Administration (FAA), left Mather AFB in 1966. The FAA and SAC Security Police Headquarters currently occupy the site. From 1960 (and possibly before) until 1966, it was reportedly common practice for personnel at the ACW radar site to dispose of waste solvents and oils into a waste disposal pipe located approximately 100 feet southwest of the ACW well. One interviewee recalled disposing of waste (TCE), used for cleaning air intake filters and transformers, and transformer oil that may have contained PCBs. Other wastes reportedly disposed of include waste engine oils, carbon tetrachloride and antifreeze. CH2M-Hill estimated that approximately 1,350 gallons of TCE and 1,225 gallons of waste transformer oil were disposed of in the pipe between 1960 and 1966.

The pipe was described as about 10 inches in diameter with a removable cap. The base bioenvironmental engineering (BEE) staff collected soil samples in November 1979 to determine the exact location of the past disposal site and the extent of soil contamination. A backhoe was used to excavate an area approximately 30 feet long and 15 feet wide. Excavation depths ranged from 4 feet at the edges to a maximum of 6 feet at the center of the site. Seven soil

samples collected at 3- to 6-foot depths were analyzed for TCE and PCBs. However, the exact location of the pipe was not found.

West Ditch (Site 15)

The West Ditch flows from north to south along the western base perimeter road and the base boundary, adjacent to and directly west of the SAC area. This unlined drainage ditch receives storm drainage from the entire main base, including the ATC and SAC shop areas.

After installation of an oil skimmer in 1967, it was reported that waste oils and solvents were dumped directly into the skimmer, which overflowed into the ditch. A past waste inventory indicated that about 30 drums of TCE were on hand in the SAC area. The wastes that overflowed into the ditch may have included some of this TCE. One of the interviewees indicated that, before the skimmer was installed, an underground tank had been located at this site for POL waste disposal and that this area was commonly referred to as the waste oil disposal site. This tank was evidently removed when the skimmer was installed.

This site may also have been subject to spills and dumping of POL waste on the ground and in the ditch. Also, since many of the floor drains in the shop areas were connected to the storm sewer system (which includes the West Ditch), waste oils and solvents from inside the shops (spills and cleaning) may have entering the West Ditch.

Northeast Perimeter

The Northeast Perimeter of Mather AFB is upgradient relative to the natural regional groundwater flow direction. Contamination carried in groundwater to Mather AFB from adjacent properties would probably enter the base from this direction. Two major industrial properties are located northeast and east of the base. They manufacture and test rocket propellants and occupy thousands of acres. A portion of the property, approximately 5 miles upgradient from the base, is known to have serious groundwater contamination (CH2M Hill, 1982). It is on the Superfund list and is being evaluated and remediated by the responsible party in cooperation with the California Department of Health Services (DOHS).

D. Identification of Laboratory Parameters

The primary purpose of the investigation at Mather AFB was to determine the presence or absence of contamination in the water table and first confined aquifer. AV also studied contamination in surface soils using soil gas monitoring at two sites. Since the Stage I report (Weston, 1986) indicated that volatile organic compounds were of concern at all three sites, all water samples were analyzed for them. In addition, all water samples were analyzed for common anions and minerals (including cations) to help determine whether water is mixing between aquifers. Samples collected from the 7100 Landfill site were analyzed for metals and cyanide as well, because of the plating baths disposed there. Table I-2 shows the analyses performed on samples from each site.

E. Identification of Field Team

The field investigation team AV assembled for the Phase II, Stage 3 study at Mather AFB included AV personnel, a drilling subcontractor and a geophysical subcontractor. The AeroVironment team included the following professionals, whose resumes are included in Appendix I.

Douglas Taylor, P.E., is a project manager in AV's Environmental Programs Division. He has an M. Engr. in environmental engineering and six years' experience in hazardous waste management and site assessments. He has managed numerous DoD, EPA, and private party site investigations and sampling programs. Mr. Taylor served as project manager for the Mather AFB study. In this capacity, he was the main interface between AV and USAFOEHL. He was responsible for the scheduling of field work (drilling and sampling), for the management of drilling and laboratory subcontractors, and for personnel staffing and technical review.

TABLE I-2. Analytical Requirements

Site(s)	Water Analyses* (method number)
No. 12 ACW Disposal Site No. 15 West Ditch Northeast Perimeter Base Production Wells	VCA (EPA 601/8020) Common Anions (SM429) Minerals (EPA 200.7) TDS (EPA 160.1) Alkalinity (SM 403)
No. 7-7190 Disposal Area	V.NA EPA HOL 3020) Vieta (N. 1005 (SM + 29)) V

^{*(}EPA, 1979; EPA - 987; t **Analyses requires % - - - - - - - -

VOA: Volatile organ, and TDS: Total Dissolved south

Timothy O'Gara is the leader of AV's Earth Sciences Section. He holds a B.A. in earth science and has seven years' experience in groundwater monitoring and hazardous waste investigations. Mr. O'Gara has directed drilling, groundwater monitoring well installation and soil sampling programs at sites throughout California. He was responsible for directing the well-drilling program at Mather AFB. His duties during this project included coordinating with base personnel, selecting well locations, supervising the drilling crews, and reporting on hydrology.

Christopher Lovdahl, an environmental chemist, holds a B.S. in environmental science and has seven years' experience in environmental compliance, waste site sampling and analytical chemistry. He worked for four years at industrial facilities and analytical laboratories prior to his IRP involvement. Mr. Lovdahl was responsible for reviewing groundwater monitoring well sampling requirements and coordinating with the instrumental-analytical laboratories. He served as the point of contact between AV and the laboratory, instructing the laboratory on selected analytical methods and special sample handling. He also made quality assurance/quality control (QA/QC) reviews of all laboratory data.

Sandy Eccker, a Geochemist with a B.S. in chemistry and an M.S. in Geology, has five years' experience in soil gas surveys, soil sampling and laboratory analysis, assisted Mr. Lovdahl in groundwater sampling, data analysis and laboratory interface.

Kenneth Napp, a hydrogeologist with an M.S. in geology, has one year's experience in the oil and gas and environmental monitoring industry. Mr. Napp served as a field geologist during the well drilling program. He was responsible for logging the samples and designing groundwater monitoring wells. He also participated in drilling, crew supervision and reporting on hydrology and geology.

Sheryl Thurston, an environmental engineer with a B.S. in environmental engineering, has two years' experience with IRP programs and state RCRA recordkeeping. Ms. Thurston served as a field engineer during well drilling at Mather AFB. She assisted with driller supervision and lithologic sample logging.

9

David Herrera, an environmental scientist with a B.S. and one year of IRP experience, served the same functions as Ms. Thurston.

Beylik Drilling Inc. of La Habra, California, performed the drilling. Beylik has 40 years' experience in drilling water production and monitoring wells at locations throughout California. The company and many of its personnel have specific experience drilling in the Sacramento area (including Mather AFB) and working on IRP programs at USAF bases. Beylik provided an Ingersoll Rand TH 100 mud rotary drilling rig and support equipment. Beylik drilled, constructed and developed all 36 groundwater monitoring wells under the direction of AeroVironment field personnel.

Earth Technology Corporation of Long Beach, California, conducted geophysical surveys on two sites at Mather AFB. Earth Technology is a geotechnical consulting firm with over nine years' experience in geophysical investigations. The surveys were conducted by Mr. Brian Bazzett under the direction of Mr. O'Gara of AV.

Tracer Research Corporation of Tucson, Arizona, conducted the soil gas surveys. Tracer, and its founder Dr. Glenn Thompson, is a pioneer in the use of soil gas surveys at hazardous waste sites and contaminant spill locations. The field work was conducted by Ken Tolman (chemist) and Marshall Krotenberg (geologist) under the supervision of Mr. Lovdahl of AV.

Acurex Corporation of Mountain View, California, performed the laboratory work. Acurex's Energy and Environmental Division joined with AeroVironment as part of the contract team for USAFOEHL. Mr. Greg Nichol (M.S., Chemistry, nine years' laboratory management experience) served as program coordinator for the Acurex effort on this task.

II. ENVIRONMENTAL SETTING

A. Physical Geography

Mather AFB is located approximately 15 miles east of Sacramento, California, and one mile southeast of the American River, in the American Basin. The basin is a broad, shallow trough surrounded by natural levees and low alluvial plains and fans. It is a flat, poorly-drained land that has received flood waters when the natural levees have overflowed.

The American Basin, with the Yolo Basin and the alluvial plains of the Sacramento River, helps to form the Sacramento Valley. This valley joins the San Joaquin River Valley to constitute the Great Valley Physiographic Province that extends south from Red Bluff, California, north from Bakersfield, California, and averages a width of 40 miles (USGS, 1979).

Tailings from a surface gold dredging operation cover the area surrounding Mather AFB to the north, northwest and west, but not the area of the base itself. This gold mining operation excavated the upper 20 to 30 feet of sediment and redeposited the gravel and cobbles as tailings (CDMG, 1975). Thus, the surface soils in this area have a high permeability.

1. Topography

Mather AFB sits on a flat alluvial plain. Elevations range from 170 feet above mean sea level (msl) on the east side to approximately 70 feet above msl on the west side. The base has relatively low relief so that runoff rates are low. This affects infiltration rates in that rainwater is retained longer.

2. Soils

Soils at Mather AFB consist mostly of gravelly or sandy loam to a depth of about five feet. Most of the base is mantled by Corning Gravelly Loam, undulating Perkins Gravelly Loam, or Redding Gravelly Loam. These soil types

have a relatively low permeability with infiltration rates of 10^{-5} to 10^{-6} cm/sec. The only difference among these three types lies in their elevation and relief. The Coining soils occur at the highest elevation of the three. They consist of a redbrown gravelly loam that grades to a clay layer at about 3 feet below land surface (bls). Clay and gravel are prominent in the 3- to 5-foot layer. The Perkins soils consist of a brown or light brown gravelly loam that grades to a red-brown gravelly, heavy clay at approximately 3 feet bls. The Redding soils consist of a red-brown gravelly loam that grades to gravelly clay at about 3 feet bls. Upper soils are generally permeable down to the clay layer, which is fairly impermeable. This layer must be penetrated in order for any significant pathway for groundwater contamination to exist.

B. Regional Geology

The Sacramento Valley is a deep structural trough bounded on the east and west by metamorphic and crystalline bedrock. The basement rocks occur at shallow depths at the edge of the basin but at great depths in the center. A thick sedimentary sequence overlies the basement rocks and ranges in age and type from Cretaceous marine to Recent alluvial deposits. The oldest sediments occur as a thick sequence of Cretaceous and Eocene marine and continental deposits that contain either saline, brackish or no water (CDWR, 1964). These rocks are impervious and therefore of little interest in this study. A generalized geological map of the area is found in Figure II-3

At Mather, the upper 600 feet of unconsolidated gravel, sand and clay are the interval of interest. These sediments range in age from Pliocene to Pleistocene and are divided into four distinct formations (CDWR, 1978):

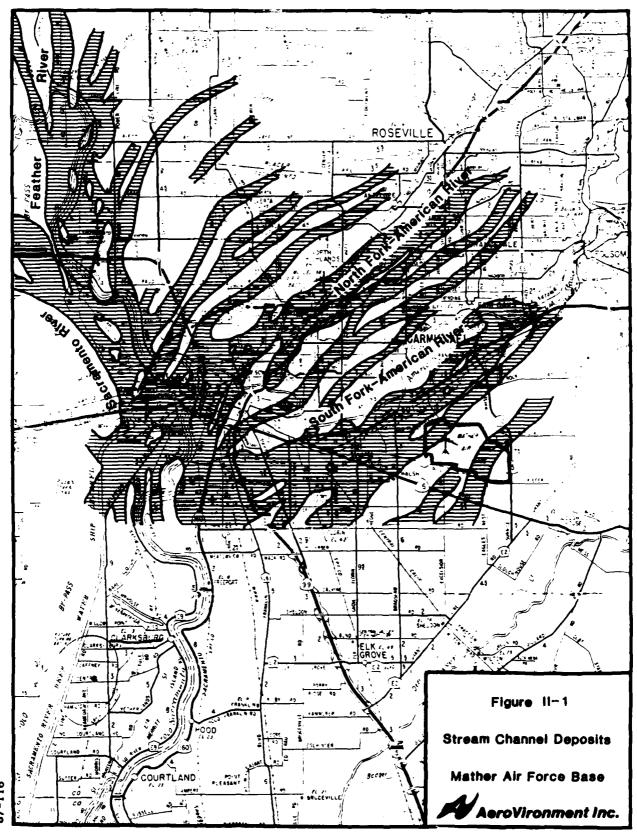
The <u>Victor Formation</u> comprises interbedded sand, silt and clay. Generally, a hardpan layer lies within 10 feet of the ground surface. The distribution of Victor sediments at Mather Air Force Base is patchy, occurring mostly on the west side of the base.

- o The South Fork Gravel consists of thick intervals (10 to 50 feet) of unconsolidated gravel and well-rounded cobbles. Beds of coarse sand or interbedded sand and silt overlie and underlie the coarse gravel and cobble members.
- o The <u>Laguna Formation</u> consists of layers of clay and silt with occasional beds of sand and, rarely, gravel. Sands and gravels occur as buried stream channels that are, in general, not laterally extensive.
- o The Laguna-Mehrten transition zone is marked by a pronounced change from the fine-grained sediments of the Laguna Formation to underlying sand and occasional gravel beds. For simplicity, the Laguna-Mehrten transition zone and underlying sediments will be referred to as the Mehrten Formation. Lithologies encountered include 20-foot-thick vertically-stacked cycles that grade from a basal gravel to a sand and finally to fine-grained material (silt and clay) (CVRWQCB, 1980).

C. General Hydrogeology

In the Mather AFB area, groundwater occurs in the post-Eocene continental deposits (<34 million years old) beneath the Sacramento Valley. Most groundwater is stored and flows through sands or sands and gravels that were deposited in the past by streams (CDWR, 1978).

The buried stream channels of the American River create superjacent deposits and are significant in affecting horizontal contaminant migration (see Figure II-1). From all indications, the superjacent deposits of the American River lie above the regional water table surface, with the exception of the perched water table condition at the 7100 Disposal Area. Horizontal contaminant transport in this unsaturated interval is doubtful. Vertical migration of contaminants from sources overlying these deposits is enhanced; however, lateral migration in this zone lacks the mechanism for transport. (EPA)



Approximate Scale: 1" equals 4 miles

Reference: CH2M Hill, Phase 1, IRP Report 1984.

June 1986

The upper 600 feet of unconsolidated gravels, sands, silts and clays at Mather AFB are significant to water supply and pollution migration. Below the soil layer the strata become more permeable. In areas where the clay layer under the surface soil has been breached, infiltration into underlying strata may be very high. Alternating layers of sand, silt and clay of varying permeability separate the surface layers and the production zone for water supply wells. (See the lithological logs for base water supply wells in Appendix D.) This zone usually occurs at approximately 100 to 150 feet bls. The percolation rate to this zone is relatively higher in those areas where upper strata are predominantly sand and silt, rather than clay.

The most significant source of recharge in this region is infiltration through stream channels, particularly the American River. In those areas where the soil is sufficiently permeable, irrigation and rainfall can be an important source of recharge as well (Weston, 1986). The Victor Formation contains a well-defined hardpan layer within 10 feet of the ground surface (CDWR, 1978). Low permeability layers in the soil mantle, coupled with the Victor hardpan, severely restrict downward movement of water. However, in certain areas the low permeability layer has been breached (by landfill trenches, sewer lines, drainage ditches) and recharge is more likely along these pathways.

Under natural conditions (when no water was being pumped), groundwater in the Mather AFB area moved from a potentiometric high near Folsom, southwest toward the Sacramento River and turned south (CDWR, 1964). However, groundwater is discharged from the Mather AFB area primarily by pumping. These groundwater withdrawals have influenced local hydrogeology so that the Sacramento and American Rivers are now a point of groundwater recharge rather than discharge, as it was before pumping. Also, the cone of depression caused by irrigation in the Elk Grove area (south and southwest of the base) influences groundwater flow at Mather AFB. While it probably does not affect the direction of regional flow, it can be directly linked to local variations in the flow path (CDWR, 1978).

Before pumping began in the Mather AFB area, groundwater in the western portion stood at approximately 60 feet above msl (30 feet bls). As of

Spring 1982, the level had receded to 10 feet above msl; a 50-foot decline in 70 years (Weston, 1986). The effects of the decline in ground water levels is regional, and results from increased well pumping for domestic and agricultural uses.

Water supply wells at Mather AFB draw water from unconsolidated gravel and sand intervals between 150 and 600 feet (bgs). Many of these water bearing zones lie below our maximum depth of investigation which was 280 feet (bgs).

D. Location of Wells

Mather AFB has 15 pumping wells that make up six water supply systems (see Table II-1). The two golf course wells are used solely for irrigation, while the jet engine test cell well is used for fire protection and washwater for jet engine testing. The AC&W well was used for fire protection but is no longer used for any purpose. The remaining eleven production wells provide the base's general water supply. The locations of base wells are shown on Figure II-2.

In general, the main base wells produce water of good quality. Based upon extensive data collected by Mather Bioenvironmental Engineering (B.E.E.) personnel since 1983, TCE contamination has not been found in any of the active base production wells, except for trace quantities (below method detection limit). Trihalomethanes (THMs), especially chloroform, have been detected at low levels in several base production wells. THMs are common byproducts of drinking water disinfection. In March 1985, 1,2-Dichloroethane was detected above the DOHS action level (up to 3.7 µg/l) in four wells -- MB-3, MB-4, Housing well No. 3, and the K-9 well. Since this was the only sampling event for the time period 1983-1986 in which this compound was detected, these results are suspect. Currently, base drinking water wells are sampled quarterly by the Mather B.E.E. for volatile halogenated organic compounds (EPA Method 601) to ensure contamination is detected if it occurs. Table II-2 shows this current data; complete results are found in Appendix P.

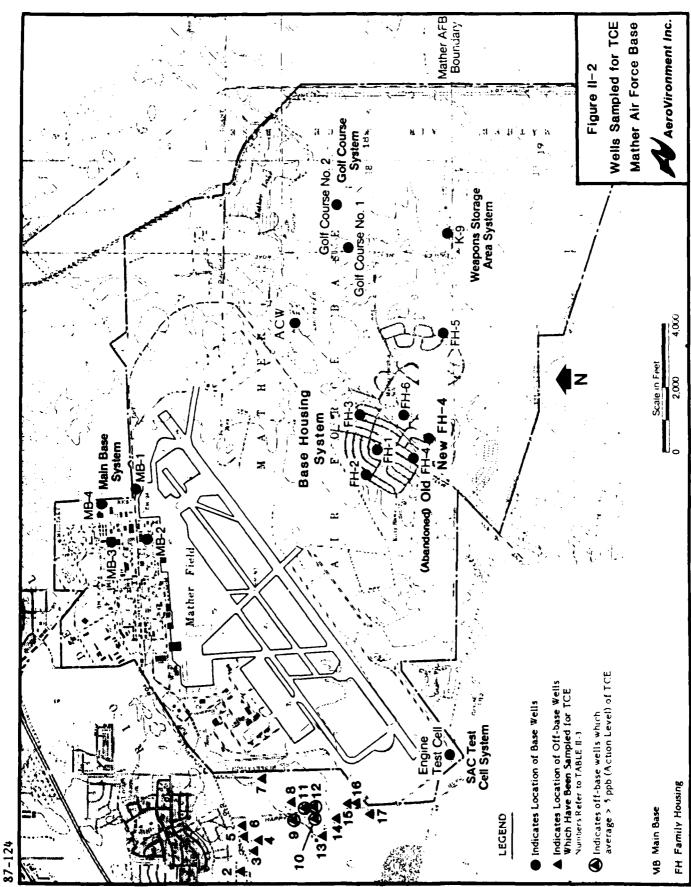
Numerous irrigation and domestic water supply wells are located within two miles of the installation boundaries. Information available on these wells is

TABLE II-1. Base Well Dataa.

Location	No. of Wells	Well Depth (ft)	Perforation Depth (ft)	Avg. Well Capacity (million gals/day)	Treatment
Main Base ^b	ħ	500-584	186-517	6.9-1.9	Chlorination
Family Housing	9	400-570	205-570	1.2-3.2	Iron & Manganese Removal, Chlorination & Flouridation
Golf Course ^C	2	403-462	No Data	1.4	None
ACW ^d	1	250	198-244	0.65	None
K-9 SAC Ordnance) ^b	_	250	No Data	0.072	Chlorination
Jet Engine Test Cell ^e	_	201	39-200	0.57	Chlorination

^aTable obtained from Installation Restoration Program Records Search, p. IV-55. bDenotes drinking water well system dDenotes irrigation well system dNot used for any purpose eFire protection well/water wash

3



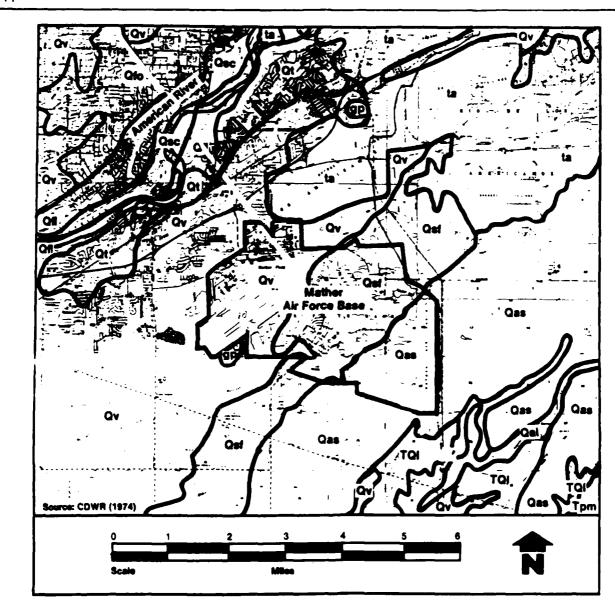
Reference: CH2M Hill Phase I IRP Report, June 1982.

TABLE II-2. TCE Sampling Results at Mather AFBa.

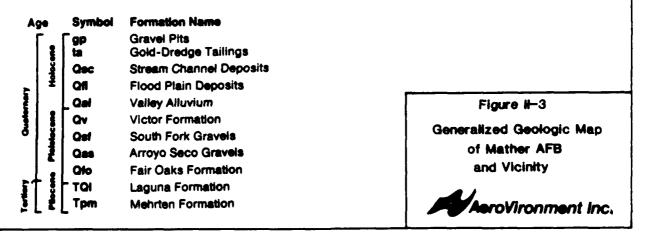
Well	Maximum Measurement of 21 Samplings (ppb)
Main Base No. 2	ND ^b
Main Base No. 3	ND
Main Base No. 4	ND
Housing No. 1	ND
Housing No. 2	ND
Housing No. 3	ND
Housing No. 4	ND
Housing No. 5	ND
Housing No. 6	ND
K-9 Well	ND

^aAll analyses performed by USAF OEHL, Brooks AFB, TX. Thirteen samplings over a three-year period (6/83-9/86). Data obtained from Mather Bioenvironmental Engineering.

^bND = none detected.



LEGEND



limited to the wells which have been tested by Central Valley Regional Water Quality Control Board personnel. The location of these wells and base wells can be seen in Figure II-2. The results of sampling conducted by the Central Valley Regional Water Quality Control Board and Sacramento County Health Department are summarized in Table II-3.

E. Meteorology

The most significant meteorological parameter in assessing the potential for contaminant movement is rainfall. In the Sacramento area, most precipitation falls during the winter and spring months, with over half occurring during December, January and February. Table II-4 shows climatological data for the period 1971-1985.

Effective precipitation can be used as an indicator of the potential for leachate generation. The effective precipitation (mean annual precipitation 20.24 inches/year minus mean annual evapotranspiration 45 inches/year) in the Mather AFB area is -24.76 inches per year. This implies that precipitation has little chance to percolate to the regional groundwater table, suggesting in turn a low potential for leachate generation via precipitation, especially considering the low permeability of soils on and near Mather AFB (EPA/530/SW-168). A monthly water balance calculation was performed, using data from nearby Nicholas, California. This calculation verified that there is no percolation during most years.

F. Site-Specific Geology

The site-specific geology at Mather AFB is broken into four separate sites shown in Figure II-4. These areas correspond to the four sites studied in this project.

o ACW Disposal Site (Site 12)

Site 12 is located just east of the central quarter of the base and includes the ACW investigation site. AV drilled eleven groundwater monitoring wells in this area. Of these, six are deep wells drilled to the first confined aquifer

TABLE II-3. TCE Sampling Results for Off-Base Wells^(a) (California State Action Level: 5 ppb TCE)

1. Brugger —		Well	Maxımum Measurement (ppb)	Date of Maximum	Average of Measurements (ppb)	Other Compounds Found
Lisher FMC Properties Yokio, west well Yokio, east well 7.2 6/84 4.4 Watsumoto House 9.3 1/82 5.6 Hayashi Z2 11/85 Furuike 15 6/84 6.5 Church of the Gedatsu 1.8 3/82 0.6 Tanaka Cordova Truck Dismanters Cordova Truck Dismanters Kobata	1. 2	Brugger Nobel	; ;	,	1	CT*
FMC Properties Yokio, west well 1.1	i ښ	Lisher			; ;	CL
Yokio, west well 1.4 3/82 0.2 Yokio, east well	4.	FMC Properties	1	1	;	
Yokio, east well Mather Camellia MHP 7.2 6/84 4.4 Matsumoto House 1.1 4/84 0.5 Rand 22 11/82 5.6 Gregory 22 11/85 7.6 Hayashi 15 6/84 6.5 Furuike 15 6/84 6.5 Church of the Gedatsu 1.8 3/82 0.6 Tanaka	۸.	Yokio, west well	1.4	3/82	0.2	PCE, CT
Mather Camellia MHP 7.2 6/84 4.4 Matsumoto House 1.1 4/84 0.5 Rand 9.3 1/82 5.6 Gregory 22 11/85 7.6 Hayashi 22 11/85 5.5 Furuike 15 6/84 6.5 Church of the Gedatsu 1.8 3/82 0.6 Tanaka Cordova Truck Dismanters 0.2 1/82 <0.2	•	Yokio, east well	ļ	ł	;	PCE, CT
Matsumoto House 1.1 4/84 0.5 Rand 9.3 1/82 5.6 Gregory 22 11/85 7.6 Hayashi 22 11/85 7.6 Furuike 15 6/84 6.5 Church of the Gedatsu 1.8 3/82 0.6 Tanaka Cordova Truck Dismanters 0.2 1/82 <0.2	7.	Mather Camellia MHP	7.2	78/9	4.4	PCE, CT
Rand 9.3 1/82 5.6 Gregory 22 11/85 7.6 Hayashi 22 11/85 5.5 Hayashi 15 6/84 6.5 Furuike 15 6/84 6.5 Church of the Gedatsu 1.8 3/82 0.6 Tanaka Cordova Truck Dismanters Mather Truck Dismanters Kobata	∞i	Matsumoto House	1.1	48/4	0.5	
Gregory 22 11/85 7.6 Hayashi 22 11/85 5.5 Furuike 15 6/84 6.5 Church of the Gedatsu 1.8 3/82 0.6 Tanaka Cordova Truck Dismanters Mather Truck Dismanters Kobata	6	Rand	9.3	1/82	5.6	{
Hayashi 22 11/85 5.5 Furuike 15 6/84 6.5 Church of the Gedatsu 1.8 3/82 0.6 Tanaka Cordova Truck Dismanters Mather Truck Dismanters Kobata	0.	Gregory	22	11/85	7.6	T-1, 2-DCE
Furuike 15 6/84 6.5 Church of the Gedatsu 1.8 3/82 0.6 Tanaka Cordova Truck Dismanters Mather Truck Dismanters Kobata	Ξ.	Hayashi	22	11/85	5.5	T-1,2-DCE;
Turuike 15 6/84 6.5 Church of the Gedatsu 1.8 3/82 0.6 Tanaka Cordova Truck Dismanters 0.2 1/82 <0.2			•			1,1-DCE
Church of the Gedatsu 1.8 3/82 0.6 Tanaka Cordova Truck Dismanters 0.2 1/82 <0.2	17.		15	48/9	6.5	T-1,2-DCE;
Church of the Gedatsu 1.8 3/82 0.6 Tanaka Cordova Truck Dismanters 0.2 1/82 <0.2						1,1-DCE; PCE;
Tanaka Cordova Truck Dismanters Mather Truck Dismanters Kobata	13.	Church of the Gedatsu	1.8	3/82	9.0	T-1,2-DCE;
Tanaka Cordova Truck Dismanters Mather Truck Dismanters Kobata						1,1-DCE;
Cordova Truck Dismanters 0.2 1/82 <0.2 Mather Truck Dismanters	14.	Tanaka	;	!	ļ	1,1-DCA
Mather Truck Dismanters Kobata	15.	Cordova Truck Dismanters	0.2	1/82	<0.2	T-1,2-DCE
•	16.	Mather Truck Dismanters	;	. 1	;	
	17.	Kobata	1	;	;	;

Data provided by Mather Bioenvironmental Engineering Shop. Samples collected and analyzed by State of California. All wells located along Happy Lane and Old Placerville Road, west of Mather AFB. ø

Compounds found with equal frequency as TCE (or without TCE). م

No record.

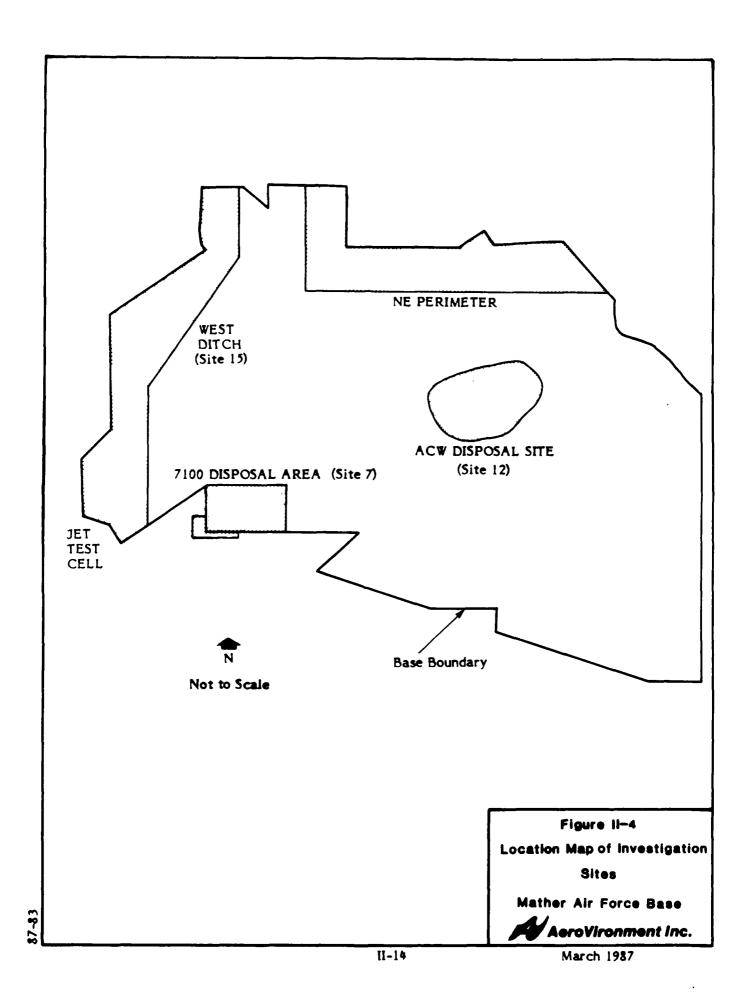
Carbon Tetrachloride

TABLE II-4. Climatological Data for Mather AFB.

PRECIPITATION (inches; 1971-1985)

73 49 61 113 21 20.24 9.13 6.71 40.23 4.40 Yrly Yrly 2 92 1.88 0.33 6.48 2.20 54 33 47 72 21 63 44 54 27 27 3.54 2.60 0.34 6.70 2.60 z z 77 51 64 101 31 1.34 1.01 0.01 3.02 4.40 0.47 0.48 0.00 1.69 1.90 87 72 72 111 44 S 91 60 73 113 50 80 0.16 0.32 0.00 1.01 < 93 60 77 112 49 0.16 0.37 0.00 1.35 1.40 \neg 86 57 72 1111 41 0.10 0.12 0.00 0.26 0.80 J 78 52 65 102 38 0.24 0.39 0.00 1.38 1.10 Σ Σ 1.53 1.27 0.18 4.64 4.30 47 53 34 34 34 4 ⋖ 3.33 2.28 0.63 8.84 1.90 64 43 54 84 25 Σ Σ TEMPERATURE (OF; 1941-1981) 2.94 2.06 0.51 6.16 3.0 59 42 51 76 25 4 Ľ 2.84 3.15 0.34 9.53 2.6 53 38 46 72 21 П Extreme Max. Extreme Min. Mean Monthly (1941 - 1981)24-Hr. Max Mean Max. Daily Min. Maximum Std. Dev. Minimum Mean

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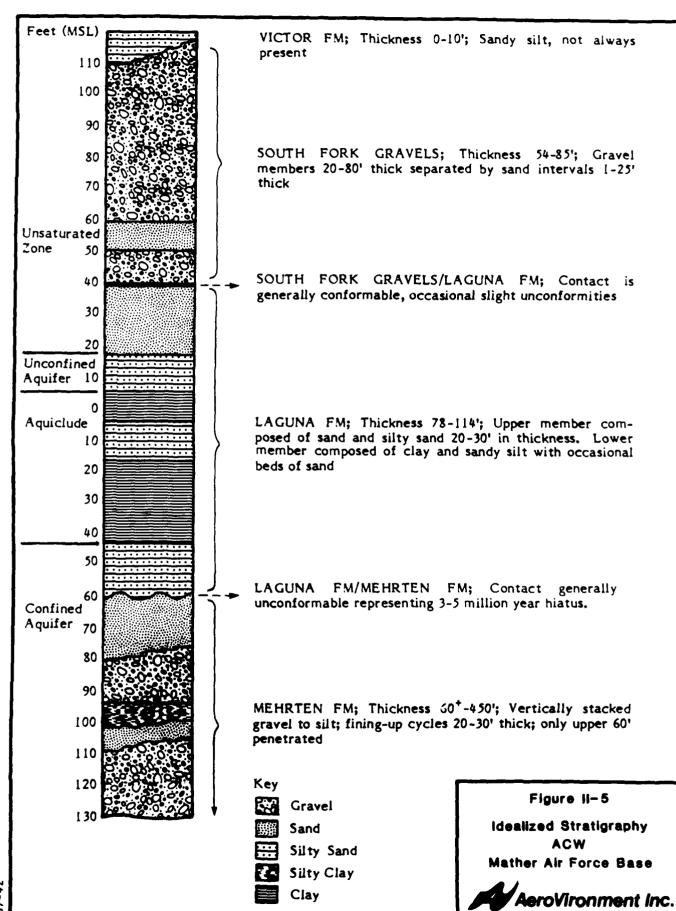


and the remaining five are shallow, drilled to the water table. In addition, this area contains three shallow wells from an earlier study (Weston Nos. 1, 2, 3) and an abandoned production well (ACW well).

Site 12 is covered by a shallow soil (<3 feet) described by the United States Soil Conservation Service (SCS) as Redding Gravelly Loam (CH2M Hill, 1982). Below the soil, the South Fork Gravel range in thickness from 50 to 88 feet (Figures II-5). These gravels are widespread: an almost continuous, laterally-extensive sheet of material characterized by thick (<80 feet) intervals of unconsolidated cobbles and gravel. There are small localized segments of Victor Formation found in the hill-top areas of the site. In most wells, this sequence is briefly interrupted by 1- to 15-foot zones of coarse sand and, more rarely, fine sand and silt. Well MAFB No.-70, in the extreme southwest corner of the ACW area, displays anomalous characteristics. It has only one 20-foot bed of South Fork Gravel with overlying and underlying material primarily composed of interbedded sand and silt. This well may fall just outside the boundary of one south fork of the American River channel, which was mapped in this portion of Mather (CDWR, 1974), thus accounting for the paucity of gravel.

Directly underlying the South Fork Gravel at 90 to 100 feet below ground surface is the Laguna Formation. It is particularly well developed in this part of the base as a 100-plus-foot thick interval of fine-grained material, primarily clay and silt with lesser quantities of sand and, rarely, pea gravel. Stream channel deposits are rare in the Laguna but have been observed in several wells as relatively thin and discontinuous sand and silt beds. Well MAFB-71 displays a distinct basal channel gravel deposit overlain by progressively finer sands that probably represent channel bedforms and overbank sediments. Vertically and laterally adjacent clay may represent swamp or overbank lacustrine deposits, suggesting that a meandering rather than a braided fluvial system was operating during the time of Laguna deposition.

The Mehrten Formation underlies the Laguna Formation at a depth of 180 to 200 feet below ground surface. The uppermost 20 to 40 feet was



penetrated only at the ACW site. These sediments are characterized by an upper 20 feet of sand (mapped locally as the Laguna-Mehrten Transition Zone) that becomes progressively coarser with depth. The sand is underlain by a basal gravel interval. This sequence is repeated and at least two distinct "gravel-to-sand" cycles have been recognized (CVRWQCB, 1980).

All wells were surveyed by a California registered surveyor and water levels are reported in elevations above or below mean sea level (see Table O-1 and O-2 for measuring point elevations).

Groundwater is first encountered at +14.7 to +22.7 msl and is occasionally semi-confined with a general flow toward the southwest. The water table is usually found in the uppermost Laguna Formation. Although the South Fork Gravel contains the coarsest material, it almost always lies above the water table because of the relatively high elevation in this part of the base. Water table conditions were encountered in all but one of the shallow wells. In that well (MAFB-52), a stiff clay was encountered at +18 feet to -38 feet msl. As a result, the well was screened in a semi-confined sandy zone (-27 feet to -47 feet msl). Water table elevations in all the shallow wells in Site 12 conform to regional trends.

Throughout the area, the Lower Laguna forms the confining layer above the Mehrten sands and gravels (confined aquifer), which first appear at -50 to -80 feet msl. Wells installed in the Mehrten were screened in a widespread sand and gravel interval encountered immediately below the Laguna. Piezometric head in the Mehrten confined aquifer ranges from +12.0 to +22.1 feet msl.

o 7100 Disposal Area (Site 7)

Site 7 is located in the southwest portion of the base and includes the 7100 Landfill investigation site. It also includes a small parcel of private land just outside the base boundary (see Figure I-3 and II-4). AV drilled a total of ten groundwater monitoring wells at this site: four to the confined aquifer in the Mehrten Formation, and six to the water table aquifer in the South Fork Gravels.

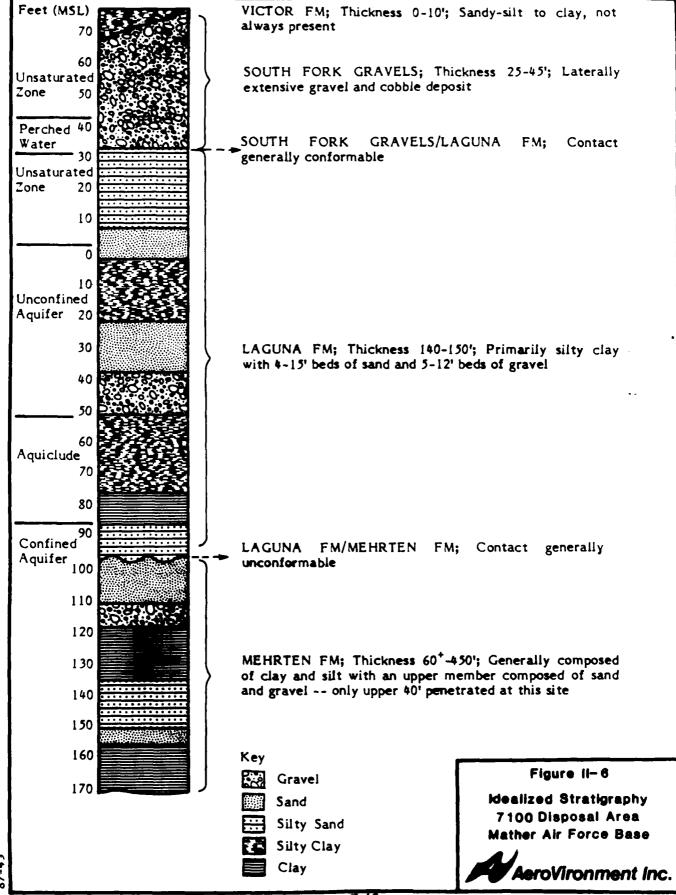
Five shallow wells from the Phase II, Stage 1 and 2 studies also lie in this area. In the SOW the Jet Test Cell wells were included in the 7100 area, but in the field they were best correlated with the West Ditch wells, that is why they are discussed in different places in the text.

The Victor Formation lies below the thin (1- to 2-foot) soil layer of San Joaquin Loam and extends in depth from 0 to 10 feet (Figures II-6). Distribution of the Victor is patchy; it occurs primarily in the southern and western portion of the 7100 Landfill site and thins to the north and east. The lithology ranges from sandy-silt to clay.

At Site 7, the South Fork Gravel underlie the Victor Formation at a depth of 0-10 feet. In the northern and eastern portion of the area the Victor is not present and the South Fork Gravel underlie the thin soil mantle. All wells encountered coarse gravels and cobbles that form an area-wide sheet of braided stream deposits to a depth of 36 feet to 46 feet below the surface. These sediments were laid down during periods of high discharge from the Sierra Nevada, probably during episodes of glacial melting (USGS, 1977).

The abrupt transition from gravel and cobbles to sand and silt at 36 to 40 feet below the surface marks the top of the Laguna Formation. The upper surface of the Laguna Formation displays some relief in outcrop exposures (CDWR, 1974), which represent a possible unconformable contact (disturbed natural succession of layers) with overlying South Fork Gravel. The Laguna is considerably coarser at Site 7 than at Site 12. The Formation's thickness ranges from 134 to 145 feet and is characterized by 10- to 50-foot intervals composed of clay and silt. These fine-grained members are separated by 10- to 24-foot thicknesses of sand and gravel, which are water-bearing materials with good porosity and permeability.

The sand and gravel of the Mehrten Formation lies below the Laguna Formation, at an average depth of 180 feet. Well MAFB-55 penetrated the upper 100 feet of the Mehrten, but the other deep wells penetrated only about 40 feet. Its maximum thickness in the Sacramento area has been mapped at 450 feet (CDWR, 1978). At Site 7, it is composed of discontinuous thin gravel beds with vertically adjacent sands and fines.

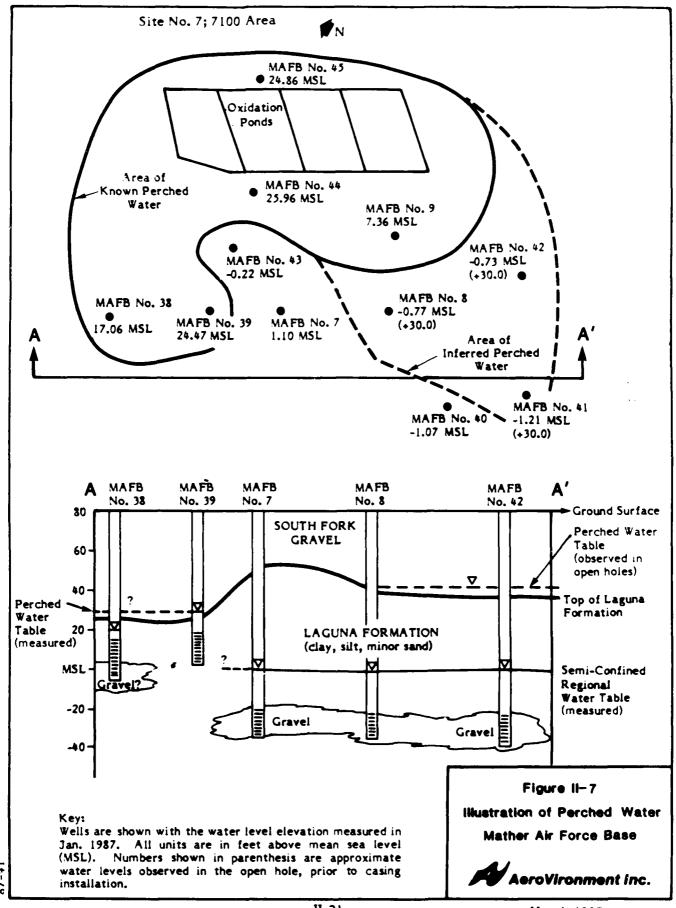


At the 7100 Landfill site very few stratigraphic units can be correlated from well to well with the exception of the thickest sand and gravel units. Lateral variation is dramatic in the smaller channel sands, which virtually disappear within several tens of feet. Well 55 displays significantly finer-grained lithologies than surrounding wells. In particular, the gravels normally present in the Mehrten Formation and occasionally present in the Laguna are absent.

The depth to first water varies at the 7100 Landfill site. For wells MAFB-56, 57 and 58, 24-inch diameter auger holes were drilled to a depth of 50 feet (approximately +30 feet msl). Eighteen-inch conducter casing was installed in the boring and grouted in place in order to shore-up the South Fork Gravels and prevent sloughing during pilot hole drilling. All borings had several feet of standing water in them within hours after completion. The conductor casing was set at the top of the Laguna Formation, suggesting that water was first encountered perched on top of the Laguna clays. Perched water in the South Fork Gravels Formation may be due to a mounding effect created by several acres of standing water in the sewage treatment oxidation ponds which is a seasonal feature. Standing water at the surface percolates downward through the South Fork Gravels and accumulates on top of the Laguna clays. Depth to perched water varies with the upper surface of the Laguna Formation. Figure II-7 illustrates this effect.

In adjacent shallow wells in the north part of the site (MAFB-44, 45, 39), groundwater was first encountered at +24.5 to +26.9 msl, a continuation of the region of perched water (Figure II-7). Centrally located wells (MAFB-43, 7) were drilled through a thickened interval of the Laguna Formation. These wells did not encounter perched water. In the southern area (MAFB 40, 41, 42), well screens were placed within gravel beds under semi-confined conditions. Piezometric head ranged from -0.7 to -3.5 msl.

All wells were screened in the upper or middle Laguna Formation. Due to the varying lithologies encountered in the Laguna, screen placement depended on the depth to the first sand below the regional water table elevation, which was anticipated to be approximately +5 feet msl. Often these sandy intervals occurred at depths ranging from -20 to -50 feet msl and were overlain by clay, creating a semi-confined condition.



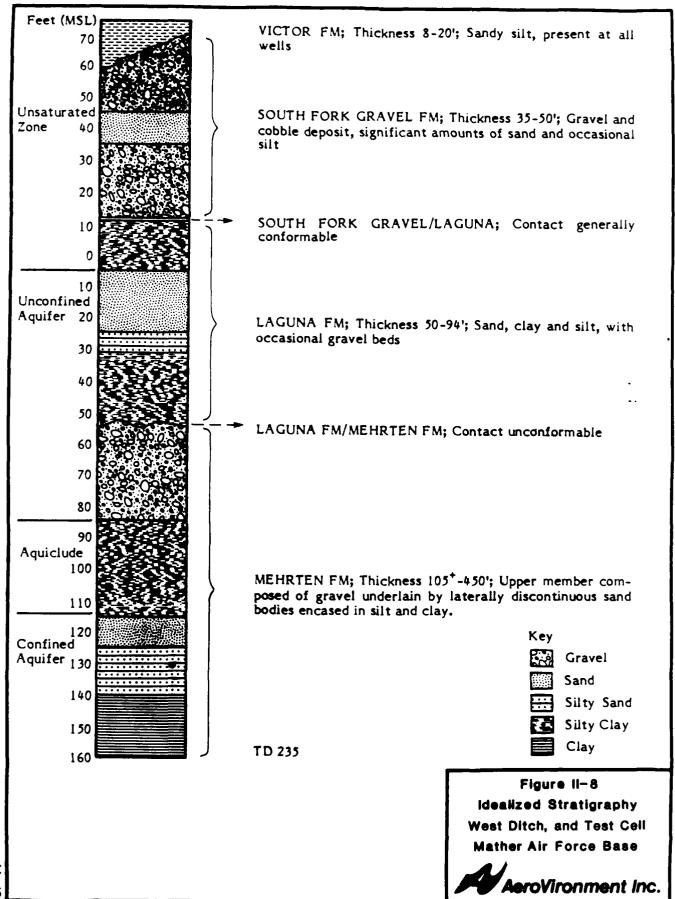
The Lower Laguna Formation forms the regional confining layer above the Mehrten sands and gravels (confined aquifer), which first appear at -100 to -119 msl. Piezometric head in the confined Mehrten Formation aquifer ranges from -2.2 to -7.4 msl. The Mehrten was screened in sandy and rare gravelly zones encountered between -96 feet and -170 feel msl. A geologic fence diagram of the 7100 area may be found in Figure IV-3 on Page IV-5.

o West Ditch Area (Site 15)

Site 15 extends along the extreme western boundary of the base. AV drilled six wells (four deep, two shallow) along the West Ditch and one shallow well (Well 49) northeast of West Ditch near the base commissary. In addition, we drilled one shallow and one deep well near the jet test cell (Wells 46 and 59) to the south of West Ditch. The area also contains two shallow wells from the Phase II, Stage 1 study.

A layered stratigraphy dominates the area, displaying relatively uniform formational thicknesses and a gentle dip to the southwest. The local stratigraphy is capped by a loamy surface soil underlain everywhere by about 8- to 20-foot-thick interval of sandy Victor Formation (Figure II-8). Below the Victor, in all wells, lie the South Fork Gravel. Gravel beds vary in thickness from 10 feet to 40+ feet and are generally thickest at the extreme central west portion of the West Ditch area. The gravel beds thin to the north and south, although the South Fork Gravel maintain an overall thickness of 35 to 50 feet.

The Laguna Formation lies below the South Fork Gravel at a depth of 52 to 72 feet below the ground surface. Formation thickness ranges from 50 to 94 feet and lithologies are dominated by sand, silt and clay. There is a higher percentage of sand in the Laguna at West Ditch than at the three other areas. Sandy intervals are up to 30 feet thick and are locally correlatable. Silt and clay occur interbedded or as homogeneous beds up to 15-feet thick. Well MAFB-60 shows an anomalous 22-foot-thick gravel bed. The geometry and relative amounts of silt, clay, gravel and sand suggest deposition by a slow, meandering fluvial system (University of Oxford, 1979).



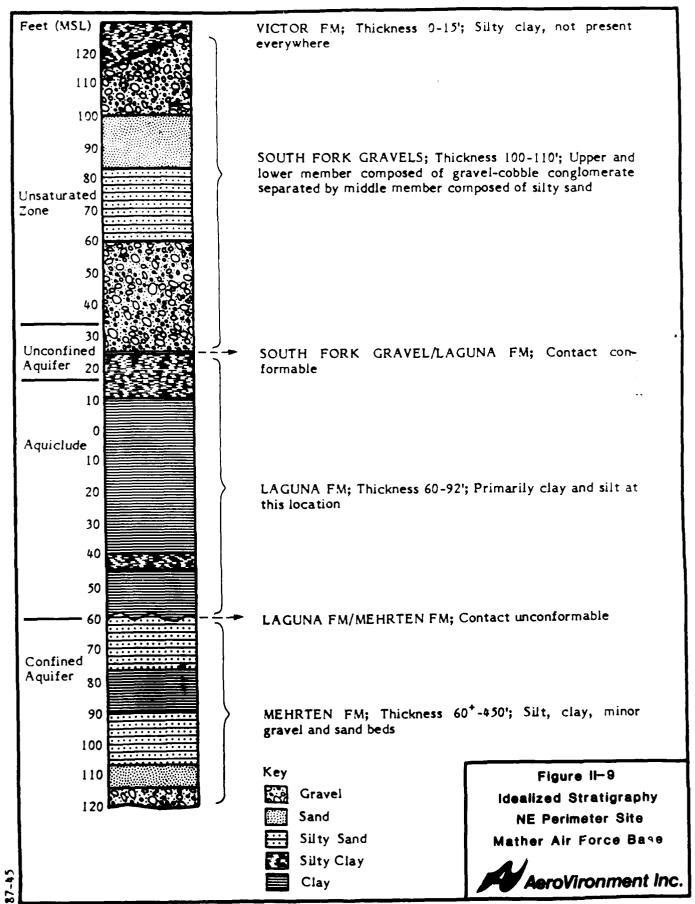
The Laguna-Mehrten contact was encountered at 110 feet below ground surface in the northern portion of Site 15 and at about 148 feet at both wells at the jet test cell. There is a gentle dip of 20 to 40 feet per mile to the southwest, which accounts for the apparent change in marker bed elevation with horizontal distance (Figure II-8). At West Ditch, the Mehrten Formation was penetrated to a depth of 115 feet below the Laguna Formation. The lithologies encountered include an upper gravel layer (15 to 35-feet thick and used a marker bed) located just below the Laguna. This locally-correlatable gravel is underlain by discontinuous bodies of sand encased in silt and clay.

Groundwater occurs under water table conditions in the Laguna Formation at all the shallow wells except near the commissary at MAFB-49, where it is semi-confined. The water table varies from +14.9 feet msl to +1.9 feet msl with surface elevation, thereby conforming to expected regional water levels. The fine grained material of the Mehrten Formation forms the confining layer above the second (Mehrten) aquifer, which was screened 171 to 204 feet below the surface in a sand and silt unit. Piezometric head in the second aquifer ranges from +1.9 feet msl to -5.6 feet msl.

o Northeast Perimeter

AV drilled six groundwater monitoring wells in this area. Of these, three are shallow and three penetrate the second (Mehrten) aquifer. The United States Conservation Service lists the soil in this area as Corning Gravelly Loam. It is generally no more than 3 to 5 feet thick and is developed on the Victor Formation or the South Fork Gravel where the Victor is absent (CH2M Hill, 1982). The Victor is composed of silty clay in this area and is present at all wells except MAFB-65 and 75 (Figure II-9).

The thickest interval of South Fork Gravel at Mather AFB is found in the Northeast Perimeter Area, ranging from 100 to 110 feet. Lithologies encountered include a 15 to 20-foot upper gravel layer and a 30- to 60-foot lower gravel layer separated by 10 to 30 feet of fines. Below the South Fork Gravel, the Laguna Formation is 60 to 92 feet thick, extending to a maximum depth of 200 feet



below ground surface. At this site, the Laguna is very fine grained composed almost entirely of clay and silt. The Laguna-Mehrten contact occurs between 170 and 200 feet below ground surface. Below the contact and to a depth of at least 280 feet (the maximum depth of the investigation), the Mehrten is composed of silty sand, clay and occasional discontinuous gravel beds.

Overall, the sedimentary sequence dips to the southwest providing a significant degree of dip between Wells MAFB-66 and 65, which lie on a roughly east-west trending line.

The above description of the Northeast Perimeter site differs slightly from that presented in the IRP Stage 2 report (AeroVironment Inc., 1986). Current revisions are based on new data collected during the drilling phase of the Stage 3 project.

Groundwater is first encountered in the South Fork Gravel at +38.4 to +21.8 feet msl under water table conditions, which conforms to regional groundwater trends. The Laguna Formation forms the confining layer over the Mehrten Formation aquifer. Piezometric head in the Mehrten confined aquifer ranges from +26.3 to +7.9 msl.

G. Site Descriptions

The locations of the sites at Mather AFB are shown in Figure II-4. This section provides physical descriptions of each of the four sites, including location, type of operation and suspected contaminants.

1. Site 7 -- 7100 Disposal Area

Site 7 is located in the southwest portion of the base, south of the now-abandoned sewage treatment plant and south of the current fire protection training area. This site also contains a borrow pit excavated to a depth of 40 feet below grade, which lies just off base to the west of the landfill.

The 7100 Disposal Area was originally a borrow pit reportedly used for the extension of the runway. Currently it is used for the disposal of inert construction rubble. From 1953 to 1966, the landfill was a disposal site for POL wastes, empty drums, sludge from the plating shop, absorbent sand used in cleaning up oil, and other wastes, including transformer oil (CH2M Hill, 1982). Currently, TCE is the only quantified contaminant at the 7100 Disposal Area (Weston, 1985).

2. Site 12 -- ACW Disposal Site

Site 12 is located in the old Air Command and Warning area in the east-central portion of the base just south of the alert apron. It is currently operated by the FAA and SAC security police; before 1966, the 668th ACW Squadron operated the site jointly with the FAA. In the Phase I, Stage I report CH2M Hill stated that waste solvents and possibly transformer oil were disposed of in a 10-inch pipe located approximately 100 feet southwest of the ACW radar installation. In the Phase II, Stage I investigation, Roy Weston, Inc., detected TCE contamination downgradient of this site.

3. Site 15 -- West Ditch

Site 15 is located in the extreme western portion of the base. It is an unlined open drainage ditch that receives storm runoff from the entire main base area.

The Phase I, Stage I report (CH2M Hill, 1982) reported that after installation of an oil skimmer in 1967, waste oils and solvents were dumped directly into the skimmer from which they overflowed into the ditch. Many of the floor drains in the shop areas were connected to a storm sewer, which may have delivered additional waste oils and solvents to the ditch. The California Regional Water Quality Control Board has detected levels of volatile organic chemicals (VOCs) (TCE and others) above the State Action Level in off-base water supply wells downgradient from West Ditch. Levels of carbon tetrachloride above the state action level have also been found in private wells along Old Placerville Road.

4. Northeast Perimeter

The Northeast Perimeter is just inside the base boundary and upgradient from the rest of the base. Contamination carried onto the base from industrial operations to the north and east would enter the base from this direction. For this reason, AV has installed three deep and three shallow groundwater monitoring wells in this area to serve as background indicators of water quality. The only contaminant confirmed in this area is 1,1,1-trichloroethane, which was found at low concentration during the Phase II, Stage 1 investigation.

H. Summary of Environmental Setting

A review of the environmental setting at Mather AFB reveals the following pertinent information:

- Soils are characterized by low permeability (CH2M Hill, 1982) and a local effective precipitation of -24.76 inches per year (CH2M Hill, 1982; NOAA, 1985), both of which create a low driving force for contaminant migration. However, a pathway for groundwater contamination may be created if the impermeable hardpan layer below the surface soil is penetrated (CDWR, 1978). The base's low topographical relief may increase the infiltration rate as well.
- Surface soils surrounding Mather AFB to the north, northwest and west are highly permeable because of past gold mining operations (CDMG, 1975). A large industrial complex upgradient of Mather AFB, which sits atop this highly permeable soil, may be a source of migrating contaminants (CVRWQCB, 1980).
- buried stream channels of the American River are known to enhance horizontal contaminant migration (CDWR, 1974). In addition, the previously mentioned industrial complex lies directly upgradient of the base and over a buried stream channel. This could contribute to contaminant migration on base as well.

- o The geology on base generally consists of surface soils of low permeability, below which lies the Victor Formation. This is made up of interbedded sands and clays, which inhibit contaminant migration from the surface. Below this Formation sits a highly permeable sand and/or gravel zone that may be South Fork Gravel, depending on the site-specific geology. Under these gravel, lies a zone similar to the Victor Formation called the Laguna Formation. The water table aquifer generally occurs in the lower portion of the South Fork Gravel or the upper Laguna Formation. The lower Laguna provides the confining layer above the Mehrten Formation, which generally contains the first confined water. The Mehrten is composed of interbedded sand, clay, silt and occasional gravel (CDWR, 1978).
- o The 15 base supply wells at Mather AFB are used for irrigation, fire protection, washwater or general water supply on base. In general, the main base wells produce water of good quality. Some off-base wells within two miles of the base have been found to contain traces of TCE (Weston, 1986).

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III. FIELD PROGRAM

A. Development

1. Preliminary Activities

AeroVironment Inc. (AV) began its involvement at Mather AFB in May 1985 as part of the Phase II Stage 2 effort. While AV was still completing the Stage 2 work at 15 sites on the base, USAFOEHL requested that AV begin a Stage 3 program to assess the conditions at the three Stage 1 sites and evaluate the work needed to further characterize these sites. The Stage 1 sites were not included in the Stage 2 sites. AV was already familiar with the general geologic and hydrologic conditions at Mather AFB based on the drilling and sampling conducted during the Stage 2 investigation. The initial Stage 3 statement of work (SOW) was agreed upon by USAFOEHL, Air Training Command state and federal regulatory personnel. After this agreement, only minor operational changes were made to the SOW by AV and USAFOEHL. Appendix B is the finalized statement of work for this task order.

2. Subcontractor Selection

- a. Drilling. The statement of work specified drilling 33 groundwater monitoring wells using conventional mud rotary technique. We selected Beylik Drilling Inc. of La Habra, California, because of their experience drilling at Mather AFB and working with AV. Beylik had performed the Stage 2 drilling for AV in 1985.
- b. Geophysical Studies. The statement of work required AV to conduct geophysical studies at the ACW and 7100 landfill sites. The Earth Technology Corporation of Long Beach, California, and Converse Consultants of San Francisco, California, were asked to submit proposals to perform the necessary work. The proposals were basically equivalent; technically and financially. Earth Technology was selected based on their experience with AV at Mather AFB during the Stage 2 effort. In addition, Earth Technology owned all of the equipment necessary for the work.

c. Soil Gas Survey. The statement of work described a soil gas survey at the ACW site to help define the TCE plume which was thought to exist. During the period from May 1986 through August 1986, AV asked three firms to submit cost estimates to complete five days of soil gas field work. Fluor Corporation (now Intellus) of Irvine, California, Woodward-Clyde Inc. of Santa Ana, California, and Tracer Research Corporation (Tracer) of Tucson, Arizona, submitted estimates. Tracer was selected based on their cost estimate and the reputation of their principal scientist, Dr. Glen Thompson.

3. Safety Plan

AV and Air Force policies require that an appropriate health and safety plan be prepared before field activities can begin. Safety concerns related to this field work focused on the hazardous nature of some chemicals suspected of being present at the site, as well as the "unknowns" relative to exact location, concentration and volume of possible contaminants. In addition, the potential for mechanical injury from drilling machinery was of concern.

The site safety plan used by AV's field team is included as part of Appendix K. It required that all field personnel wear standard work outfits (steel-toed boots, hardhats, etc.). It also required that the air at all sites be monitored for organic vapors, oxygen deficiency and explosive gases.

Work at all the sites at Mather AFB consisted of drilling and groundwater sample collecting. These activities bring to the surface potentially contaminated soils and water that were previously isolated. The potential for skin exposure or inhalation was significant. The drilling program was specifically designed to eliminate drilling through waste material or spill sites. AV placed all wells at upgradient or downgradient locations. All work areas were relatively flat, out of doors, with good air circulation. At each sampling location, when handling apparently uncontaminated samples, workers wore new, disposable latex gloves at each sampling location to keep skin clean and to avoid cross-contamination from sample handling.

The ambient air was monitored to alert the field team if hazardous concentrations in the breathing zone rose above acceptable levels. The following action levels were set up for organic vapor meter readings:

0-5 ppm (above background): no respiratory protection needed

5-50 ppm: air purifying respirator with

organic chemical cartridge

50 - 500 ppm: self-contained breathing apparatus

500 ppm and above: no work

Other criteria were set for oxygen deficiency and explosive gases.

The site safety plan was submitted to the California Department of Health Services (DOHS) for review and approval. Approval was received from the DOHS project officer on August 8, 1986.

B. Implementation of Field Program

1. Drilling and Well Installation

Using information derived from earlier IRP studies, we selected well locations both downgradient and upgradient from the sites to be investigated. At the 7100 Landfill site we used geophysical survey results to "fine tune" the drilling location to intercept any contamination plumes. Well locations were coordinated with the California Regional Water Quality Control Board and the Department of Health Services Toxic Substances Control District before drilling started. Table III-1 shows the schedule of drilling and well construction.

All wells were drilled using conventional mud-rotary methods using an Ingersoll Rand T-100. This drilling method has been approved by the California Regional Water Quality Control Board and has been used successfully to drill numerous monitoring wells into the confined aquifer system near Mather AFB. A 24-inch flight auger was used to drill and install 18-inch conductor casing to a depth of 55 ft in all of the deep wells at the 7100 area (see Table III-2) after a severe sloughing problem was encountered in the shallow gravels (0-50'). The conductor casing prevented gravel sloughing and allowed more efficient drilling of the pilot boring.

TABLE III-1. Well drilling, construction and development timetable.

Date	Drilled	Constructed	Developed
8/15	43		
3/16 8/17	43	43	
8/17 8/19	44	4)	
3/20	44	44	
3/21	45	1. 5	
8/22 8/23	47	45	
3/24	48	47	
3/25 2/26	63	48	
8/26 8/27	63	63	
8/28		63	
8/29		63	
9/2 9/3	63	63	
9/4	63, 62		
9/5	62	63	
9/6 9/7	62	63 63	
9/8	62, 61 61	63	47, 43, 40
9/9	•	61, 62	45, 63, 48
9/10		61, 62	45, 48, 6
9/11 9/12	65, 64	62, 61	6; 6;
9/13	0), 64	65, 64	0.
9/14	49	65, 64	
9/15	49, 66	49	
9/16 9/17	40 41	66, 40 66, 41	
9/18	46, 42, 55, 52	66, 41, 42	
9/19	55, 46	46	
9/20	59	55	
9/21 9/22	57	55, 59 59	
9/23	58	57, 58	
9/24		57, 58	
9/25	56	58, 56	
9/26 9/27	60 50	56 60, 50	
9/28	68	60	
9/29	73, 68	73	62, 40
9/30	75	68, 75	49, 61, 60
10/1 10/2	52, 67 70, 67	68, 52 67	61, 58, 55, 40 49, 61, 56, 43
10/3	, , , ,	70, 67	57, 41, 40, 68
10/4		67, 70	68, 64, 65, 7
10/5	54, 69	54	75, 66, 7
10/6 10/7	71	69 71, 69	70, 52, 50 50, 59, 6
10/8	51, 53	71, 67	61, 54, 63
10/9	53, 72	51, 53	69, 7
10/10	72, 76	76, 72	53, 5
10/11 10/12		72	76, 6. 7:

a. Well Installation

o Shallow Wells

Eighteen shallow wells were installed to monitor the upper most saturated zone at Mather AFB. Figure I-3 showed the location of these wells. Figure III-I illustrates a typical shallow monitoring well, and Appendix D contains schematic diagrams of all wells installed for this project, along with the lithologic and geophysical logs of the borings. Table III-2 shows the well depths and screened intervals for the shallow wells.

Initially, a 9-7/8" borehole was drilled to an average depth of 120 feet below ground surface. AV's on-site hydrogeologist collected and described the drill cuttings. AV personnel determined the total depth of each boring, depending on the regional water table elevation and the type of material encountered during the drilling.

Once the bore hole reached the desired depth, we ran an E-log (SP, lateral resistivity and point resistivity). Using drill cuttings, E-log traces and data from adjacent wells, the on-site hydrogeologist designed the well to maximize its production potential and to assure that the well screen was set at the first extractable water encountered. The well design conformed to the Air Force's general specifications and to the specific subsurface condition found at the site.

o Deep Wells

Eighteen deep wells were installed to monitor the first (uppermost) confined aquifer (Laguna or Mehrten Formation). Figure I-3 showed the location of these wells. Figure III-2 diagrams a typical deep well, and Appendix D contains diagrams of all wells installed along with lithologic and geophysical logs of all the borings. Table III-2 shows the well depth and screened intervals for the deep wells. Initially, we experienced some trouble logging and completing the holes. This was entirely caused by equipment breakdowns, poor quality (in some cases slightly bent) conductor casing, and improper mud

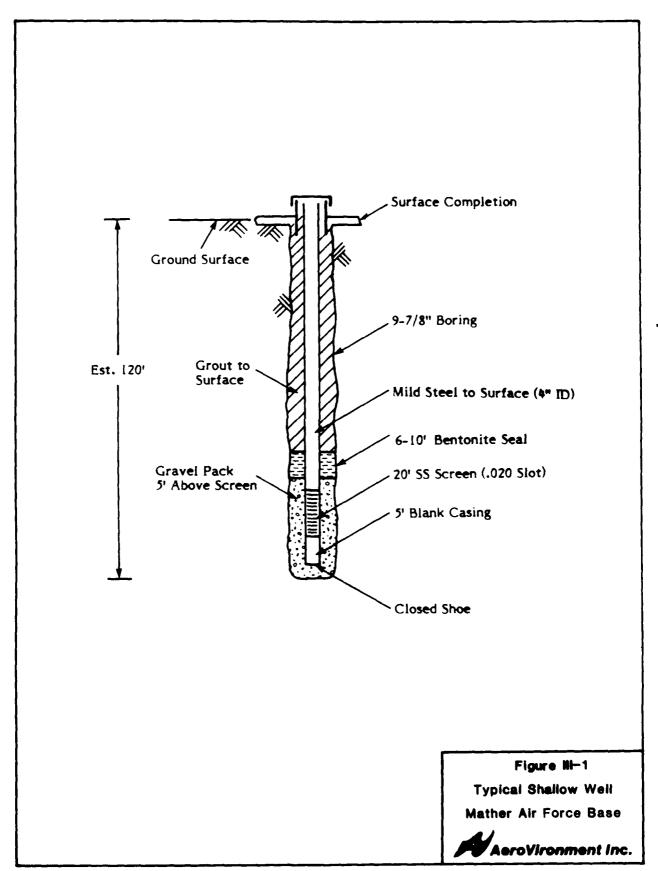


TABLE III-2. Well Depths and Screened Intervals

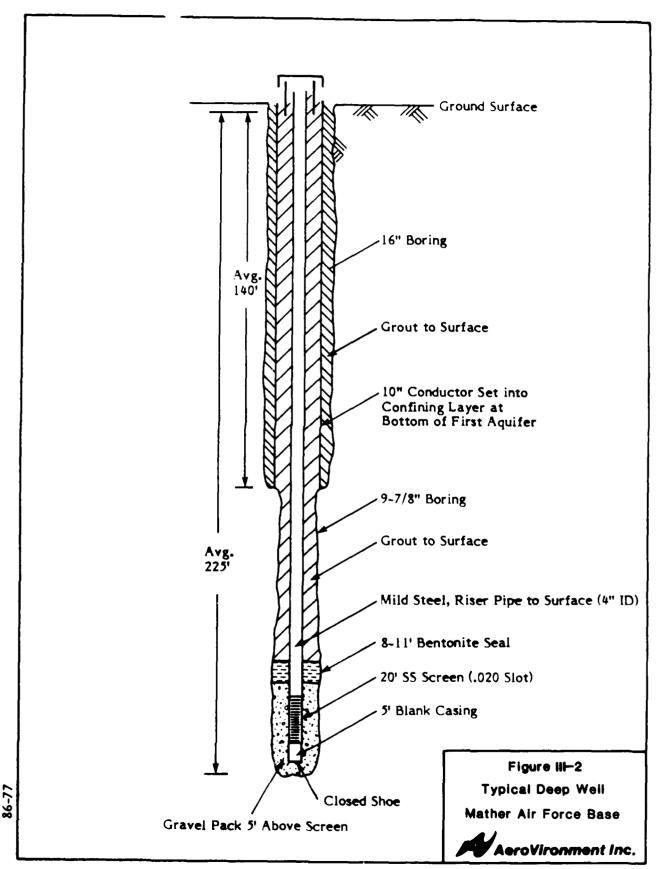
Shallow Wells

Well No.	Site	Total Depth in Ft. Below Ground Surface	Screened Interval (Ft. Below Ground Surface)
40	7100	124	92-112
41	7100	150	100-120
42	7100	133	90-110
43	7100	133	108-128
44	7100	110	60-80
45	7100	105	55-75
46	Jet Test Cell	116	70-90
50	ACW	130	100-120
51	ACW	170	105-125
52	ACW	140	105-125
53	ACW	181	157-177
54	ACW	144	110-130
47	West Ditch	108	75-95
48	West Ditch	133	70-90
49	(West Ditch) Commissary	122	99-119
73	NE Perimeter	135	112-132
75	NE Perimeter	114	91-111
76	NE Perimeter	121	87-107

TABLE III-2. (con't)

Deep Wells

55 7100 250 225-245 126 56 7100 209 177-197 156 55 57 7100 200 177-197 156 55 58 7100 245 171-191 150 55 59 Jet Test Cell 246 160-180 131 55 67 ACW 213 190-210 117 68 ACW 245 207-227 110 69 ACW 245 207-227 110 70 ACW 205 183-203 142 70 ACW 207 207-227 170 70 ACW 205 183-203 142 71 ACW 206 175-195 164 55 60 West Ditch 240 184-204 165 61 West Ditch 240 175-195 <	Well No.	Site	Total Depth (ft)	Screened Interval (ft)	Depth to Bottom of Conductor (ft)	Depth to Bottom of Surface Casing (ft)
7100 209 177-197 152 7100 200 177-197 156 7100 245 171-191 150 ACW 249 160-180 131 ACW 213 190-210 117 ACW 245 207-227 110 ACW 205 183-203 142 ACW 247 200-220 177 ACW 246 192-212 130 West Ditch 245 175-195 164 West Ditch 240 184-204 165 West Ditch 240 181-201 165 West Ditch 240 175-195 155 NE Perimeter 280 247-267 142 NE Perimeter 240 175-195 115 NE Perimeter 240 175-195 115	55	7100	250	225-245	126	
7100 200 177-197 156 7100 245 171-191 150 ACW 240 160-180 131 ACW 213 190-210 117 ACW 245 207-227 110 ACW 205 183-203 142 ACW 205 183-203 142 ACW 247 200-220 177 ACW 247 200-220 177 ACW 245 175-195 164 West Ditch 245 175-195 165 West Ditch 240 181-201 165 West Ditch 240 175-195 155 NE Perimeter 280 247-267 142 NE Perimeter 224 195-215 115 NE Perimeter 240 175-195 115	56	7100	209	177-197	152	55
7100 245 171-191 150 Jet Test Cell 240 160-180 131 ACW 213 190-210 117 ACW 245 207-227 110 ACW 237 207-227 130 ACW 205 183-203 142 ACW 247 200-220 177 ACW 216 192-212 130 ACW 216 192-212 130 West Ditch 245 175-195 164 West Ditch 240 181-201 165 West Ditch 240 175-195 165 NE Perimeter 240 175-19	57	7100	200	177-197	156	55
Jet Test Cell 240 160-180 131 ACW 213 190-210 117 ACW 245 207-227 110 ACW 237 207-227 130 ACW 205 183-203 142 ACW 247 200-220 177 ACW 216 192-212 130 West Ditch 245 175-195 164 West Ditch 240 181-201 165 West Ditch 242 175-195 165 West Ditch 242 175-195 142 NE Perimeter 224 195-215 115 NE Perimeter 240 175-195 115 NE Perimeter 240 175-195 115	58	7100	245	171-191	150	55
ACW 213 190-210 117 ACW 245 207-227 110 ACW 205 183-203 142 ACW 205 183-203 142 ACW 247 200-220 177 ACW 216 192-212 130 West Ditch 245 175-195 164 West Ditch 240 181-201 165 West Ditch 242 175-195 165 NE Perimeter 280 247-267 142 NE Perimeter 240 175-195 115 NE Perimeter 240 175-195 115	59	Jet Test Cell	240	160-180	131	55
ACW 245 207-227 110 ACW 237 207-227 130 ACW 205 183-203 142 ACW 247 200-220 177 ACW 216 192-212 130 West Ditch 245 175-195 164 West Ditch 240 184-204 165 West Ditch 240 181-201 165 West Ditch 242 175-195 155 NE Perimeter 280 247-267 142 NE Perimeter 224 195-215 115 NE Perimeter 240 175-195 115	29	ACW	213	190-210	117	!
ACW 237 207–227 130 ACW 205 183–203 142 ACW 247 200–220 177 ACW 216 192–212 130 West Ditch 245 175–195 164 West Ditch 240 181–201 165 West Ditch 240 181–201 165 West Ditch 242 175–195 155 NE Perimeter 280 247–267 142 NE Perimeter 224 195–215 115 NE Perimeter 240 175–195 115	89	ACW	245	207-227	011	;
ACW 205 183-203 142 ACW 247 200-220 177 ACW 216 192-212 130 West Ditch 245 175-195 164 West Ditch 240 181-201 165 West Ditch 240 181-201 165 West Ditch 242 175-195 155 NE Perimeter 280 247-267 142 NE Perimeter 224 195-215 115 NE Perimeter 240 175-195 115	69	ACW	237	207-227	130	;
ACW 247 200-220 177 ACW 216 192-212 130 West Ditch 245 175-195 164 West Ditch 240 181-201 165 West Ditch 240 181-201 165 West Ditch 242 175-195 155 NE Perimeter 280 247-267 142 NE Perimeter 224 195-215 115 NE Perimeter 240 175-195 115	70	ACW	205	183-203	142	;
ACW 216 192-212 130 West Ditch 230 184-204 164 West Ditch 240 181-201 165 West Ditch 242 175-195 155 West Ditch 242 175-195 155 NE Perimeter 280 247-267 142 NE Perimeter 224 195-215 115 NE Perimeter 240 175-195 115	7.1	ACW	247	200-220	177	!
West Ditch 245 175-195 164 West Ditch 230 184-204 165 West Ditch 240 181-201 165 West Ditch 242 175-195 155 NE Perimeter 280 247-267 142 NE Perimeter 224 195-215 115 NE Perimeter 240 175-195 115	72	ACW	216	192-212	130	!
West Ditch 230 184-204 165 West Ditch 240 181-201 165 West Ditch 242 175-195 155 NE Perimeter 280 247-267 142 NE Perimeter 224 195-215 115 NE Perimeter 240 175-195 115	09	West Ditch	245	175-195	191	55
West Ditch 240 181–201 165 West Ditch 242 175–195 155 NE Perimeter 280 247–267 142 NE Perimeter 224 195–215 115 NE Perimeter 240 175-195 115	61	West Ditch	230	184-204	165	!
West Ditch 242 175-195 155 NE Perimeter 280 247-267 142 NE Perimeter 224 195-215 115 NE Perimeter 240 175-195 115	62	West Ditch	240	181-201	165	1
NE Perimeter 280 247-267 142 NE Perimeter 224 195-215 115 NE Perimeter 240 175-195 115	63	West Ditch	242	175-195	155	1
NE Perimeter 224 195-215 115 NE Perimeter 240 175-195 115	99	NE Perimeter	280	247-267	142	1
NE Perimeter 240 175-195	65	NE Perimeter	224	195-215	115	1
	79	NE Perimeter	240	175-195	11.5	1



viscosity/thickness. The South Fork Gravels, which are found very near the surface, are very difficult to drill with any method. In an effort to seal the borehole during the initial phases of drilling, a number of different things were tried. One of these was working with the mod consistency. After the initial problems were worked out, and the proper conductor casing was delivered, the work went smoothly.

Beylik drilled a pilot bore with a diameter between 6 and 9-7/8" for all deep wells. Originally, the pilot boring was 5-7/8"; this was increased to 9-7/8" after we began having trouble getting the E-log probe to drop through the smaller boring. The total depth of the pilot bore depended on the depth to the first sandy or gravelly bed encountered below the Laguna Formation, which generally forms the confining layer. Once the pilot bore was completed to the desired depth, we ran an E-log (SP, lateral and point resistivity). The criteria evaluated to determine screen placement were the same as for the shallow wells.

Once Beylik had the casing schedule (well design), they reamed the pilot bore at a diameter of 15" - 17" to the required depth and grouted a 10" inner diameter (ID) conductor casing in place to seal off the uppermost water bearing zone (water table). The annular space between the conductor casing and bore hole was pressure grouted, using a construction tremie pipe with either neat cement (9-sack) or "Class A" (6-sack) Portland cement-sand slurry with up to 5% bentonite to reduce shrinkage. The grout used to fill the annular space between the bore hole wall and the conductor casing prevents contamination from migrating between the ground surface and the water-table. No further work was permitted in the hole until the grout had set, as determined by the examination of grout samples collected at the time of emplacement.

o Well Screening and Sealing

The well screen and 4" ID riser pipe were suspended in tension from the surface by means of a clamp. The bottom of the well screen was at a sufficient distance above the bottom of the bore hole to ensure that none of the casing would be supported by the bottom of the hole. Beylik placed centralizers at each end of the screened interval and with 40-foot spacings on the

blank pipe. Before the gravel pack was placed, they thinned the drilling fluid with clean water from the installation drinking water system.

Gravel pack (8-12 granular mesh) was installed using a construction tremie pipe and extended to a height of five feet above the top of the well screen. A two- to three-foot very fine-grained silica sand was installed above the gravel pack. The tight-packing nature of the very fine silica sand prevents overlying bentonite from contaminating the gravel pack and hindering the well development process. Next, Beylik placed an additional six- to eight-foot bentonite seal (1/4-inch pellets) directly above the silica sand. From the top of the bentonite to the surface, the annular space between the well casing and the bore hole or conductor casing was pressure grouted via a tremie pipe, using the same grout mixture that was used to grout the conductor in place. At no time was the grout allowed to free-fall more than 20 feet from the bottom of the tremie pipe.

b. Well Development

Beylik developed the wells shortly after they were drilled, using standard water well techniques (Driscoll, 1986). All wells were first swabbed and bailed using a close-fitting dart-bottom suction bailer to remove any sediment buildup that would fill the screened interval of the well casing. Next, Beylik pumped until the water was flowing clean and clear. Finally, Beylik bailed out all sediment that had accumulated during pumping and capped the well. By using this method, the average well was developed in four hours.

c. Surface Completion

One well (MAFB 69), sited within the ACW, development was completed flush with the ground surface and placed in a concrete "christe" box with a locking cap. The remaining wells extend two to three feet above ground surface. We shielded them with a steel guard pipe and working lid set in a four-foot square, four-inch thick concrete pad. All well casings were topped with threaded plastic caps.

2. Groundwater Sampling Phase

AV conducted two rounds of groundwater sampling approximately one month apart. Table III-3 summarizes specific sampling information. Table III-4 shows the sampling dates. Each sampling round included 35 wells installed as part of Phase II, Stage 3, 1 well installed as part of Stage 2, and 8 of 11 wells from Stage 1 for a total of 44 monitoring wells. AV sampled 10 out of 15 production wells during the second round. Figure I-3 shows the monitoring well locations.

AV collected one set of samples for analysis by Acurex and a complete set of split samples for USAFOEHL. The California Regional Water Quality Control Board also received a split of all volatile organic analysis samples.

For each sampling round, two field crews were mobilized: a well evacuation crew of two members and a sampling crew of two to three members. The evacuation crew initiated the operation by measuring the static water level with a Powers Electric well sounder. Then five casing volumes were removed from the well with a submersible impeller pump. While pumping, the crew recorded initial and final readings for water pH, conductivity and temperature. These data appear in Appendix G (Table G-2). AV used an Orion Research Model 211 pH meter and a Horizon Ecology Type 1840-10 conductivity meter. Unless the well needed more time to recover, the sampling crew immediately began the sampling procedure. Two members sampled the well with a 1-7/8 inch diameter stainless steel bailer and nylon rope pulley system, while the third documented the sampling. A dedicated sampling line was used at each well. The volume of water removed depended on the types of chemical analyses for which the sample was needed. Table III-3 shows the types of analyses, size of samples, and preservatives required.

The first two bailers of well water were used to rinse the decontaminated sample bucket. Volatile organic analysis (VOA) samples were taken first and poured directly from the bailer into the sample bottles. After the required volume for additional parameters was poured into the sample bucket, the sample was funneled into the appropriate sample bottles. For metals samples, the sampling crew carefully filtered the water through a Geotech pressurized

TABLE III-3. Analytical and Sampling Methods Summary

Parameter	Method	Description	Method Detection Limit (MDL)	Maximum Holding Time	Preservation	Sample Container	2nd Column Confirmation
Volatile Organics	EPA 601	Purgeable Halocarbons	As specified	14 days	Cool to $\psi^0 C$	40 ml glass	Analyte > MDL
		by Hall/GC	in methods				
	EPA 8020	Aromatic volatile		7 days	Cool to 4°C	40 ml glass	Analyte >
		organics by PID/GC					100
Petroleum Hydrocarbons	EPA 3550 EPA 418.1	Total petroleum hydro- carbon compounds IR method	I mg/L	28 days	H ₂ SO ₄ to pH < 2 Cool to 4°C	l L glass	
Total Phenolics	EPA 420.1	Total phenolic compound content, colorimetric method	5 µg/L	28 days	H ₂ SO ₄ to pH < 2 Cool to 4°C	l L glass	
Соиннов Атопя	SM 429	F', CL', NO_Z^2 ', PO_4^3 ', BR', NO_2^3 ', SO_2^4 by ton chromatography	As specified in method	CL, F, Br, SO ₄ : 28 days, NO ₂ , NO ₃ , PO ₄ : 48 hrs	Cool to 4°C	I L HOPE*	
Metals & Minerals	EPA 200.7	Ba, Cd, Ca, Cr, Fe, Pb, Mg, Mn, Ag, Na, K by ICP	See Appendix A Page 20	6 months	HNO ₃ to pH < 2 Coal to 4 C	і с норе	
Arsenie	EPA 206.2	As by graphite furnace AAS	0.001 mg/L	6 months	HNO ₃ to pH < 2 Cool to 4 C	IL HOPE (with Hg, Se)	
Mercury	EPA 245.1	Hg by cold vapor AAS	0.0002 mg/L	28 days	HNO ₃ to pH < 2 Cool to 4°C	1 L HDPE (with As, Se)	
Sefenum	EPA 270.2	Se by graphite furnace AAS	0.002 mg/L	6 months	HNO, to pH < 2 Cool to 4°C	I L HDPE (with As, Hg)	
TDS	CPA 160.1	Total filterable	10 mg/L	48 hours	Cool to 4°C	1 L HDPE resid	I L HDPE residue by gravimetry
Alkalını ty	SM 403	Carbonate, bicarbonate and hydroxide alkalinity		14 days	Cool to 4 ^o C	LL HDPE (with TDS)	
Cyanide	EPA 335.2	CN ⁺ analysis by UV visible spectroscopy	.01 mg/L	30 days	NaOH to pH > 12 Cool to 40 _C	I L HDPE	

TIMBER . L. A. . morte, molitarian

TABLE III-4. Sampling Timetable

Date	Wells Sampled (Does not include duplicate or split samples)
Round 1	
11/10/86	51, 52
11/11/86	70, 53, 71, 54, 72, 03
11/12/86	67, 68, 01, 50, 02
11/13/86	69, 63, 48, 11, 61
11/14/86	10, 47, 60, 64, 76, 62
11/15/86	75, 65, 73, 66, 49, 45
11/16/86	46, 59, 08, 58, 09
11/17/86	43, 07, 44, 55, 40
11/18/86	42, 57, 41, 56
Round 2	
12/8/86	48, 63, 11
12/9/86	61, 62, 47, 60, 46, 59, 40, 55, 08
12/10/86	65, 76, 75, 64, 73, 66
(Base Production Wells)	HW-04, MB-01, K-9, HW-03, MB-04, HW-05,
	HW-06, HW-01
12/11/86	58, 09, 42, 57, 41, 56, 07, 43
12/12/86	44, 45, 49, 70, 52, 53, 71, A6-01, JT-01
12/13/86	54, 72, 50, 51, 69, 68, 01, 67
12/14/86	02, 03

0.45-micron filter with a glass pre-filter. They then administered any required preservatives and sealed, labeled and immediately stored the sample bottles in iced coolers.

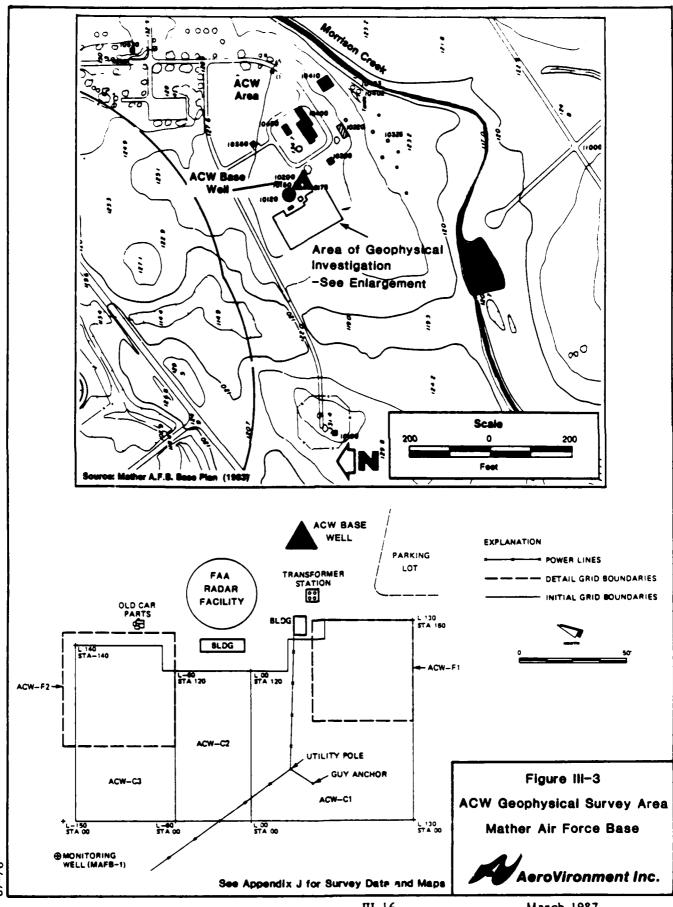
Between well samplings, the sampling crew decontaminated all the sampling equipment. This process included a wash with Alconox detergent, a rinse with drinking-quality water and a second rinse with de-ionized water. We then wrapped the equipment in aluminum foil to ensure cleanliness. The well sampler (i.e., the crew member who handled the sample bailer) wore a new pair of latex surgeon's gloves while sampling each well.

After the day of sampling, the field crew packed the samples, including 10% of the split samples for blind quality assurance analyses, with completed chain-of-custody forms. One field blank was prepared for each sampling round. All samples were shipped with security seals for overnight delivery via Greyhound Bus Lines to Acurex Labs.

3. Geophysical Program

Geophysical surveys were conducted at two Mather AFB sites before drilling began at these sites. Field work was completed between August 18 and August 23, 1986. The objective of the survey at the ACW site was to locate a buried disposal pipe using a magnetometer, pipe locator and ground penetrating radar (Figure III-3). Work at the 7100 Landfill used ground conducting instrumentation to outline the plume of contaminated groundwater flowing away from the site (Figure III-4). AV used the results of these surveys to select optimum locations for groundwater monitoring wells.

The terrain conductivity method employed at the 7100 Landfill site uses the principle of electromagnetic induction to measure soil conductivity and to map changes in conductivity (Driscoll, 1986). Changes in conductivity can be caused by changes in geologic structure (groundwater zones, shallow bedrock and fault/fracture zones) or can be the result of cultural activities (buried pipelines, drums, trenches filled with metal objects, and chemical spills).



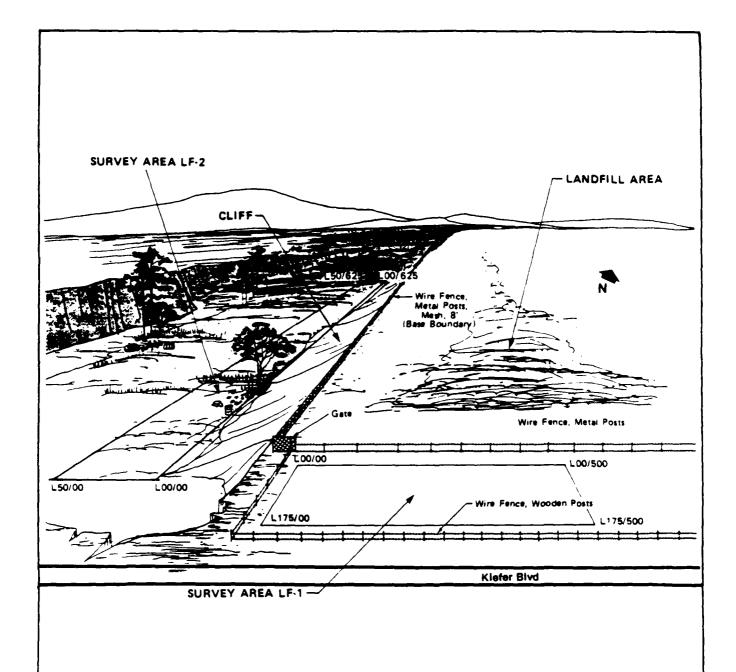


Figure III-4
7100 Disposal Area
Geophysical Survey Area
Mather Air Force Base

See Appendix J for Survey Data and Maps

AeroVironment Inc.

The survey used a Geonics EM-34 ground conductivity meter in the horizontal dipole configuration. For this study, Earth Technology collected along profiles at 25-foot intervals for each of three dipole (coil) spacings: 10, 20 and 40 meters (m). The 10, 20 and 40 m coil separations provide nominal effective exploration depths of 7.5, 15, and 30 m, respectively. By taking data at different spacings along a profile, both vertical and lateral variation in conductivity could be observed.

The EM-34 measures conductivity directly in units of millimhos per meter (mmho/m). Earth Technology recorded these data in a notebook in the field and later entered them manually into the computer. They were plotted in contour and/or 3-D form for presentation.

The magnetic profiling at the ACW site used an EDA PPM-500 magnetometer. Earth Technology made readings with the magnetometer sensor at a height of 3 feet above the ground instead of the usual 3 feet. This reduction in height enhanced identification of small, near-surface targets. Earth Technology initially collected data with 10-foot line spacing and 5-foot station spacing on the lines. In areas where anomalies were found, they conducted a more detailed survey using 5-foot line and station spacing. The data were stored in the instrument's memory as each reading was made. When all the readings planned for a grid had been taken, the data were transferred to a floppy disc by interfacing the instrument with a Compaq microcomputer. The reduced data represent the total magnetic field in units of gammas and were presented in contour maps.

Ground-penetrating radar profiling was done with a SIR (subsurface interface radar) System-3 manufactured by G.S.S.I. A 300 mhz antenna was used. GPR profile lines were run 5 feet apart. The output of the GPR system is a continuous analogue profile with vertical lines marking the station location. The purpose of the GPR survey was to pinpoint the disposal pipe within a small area indicated by the magnetometer, as the GPR has a very small "search radius." The depth of investigation was between four and six feet.

4. Electromagnetic Pipe Locator

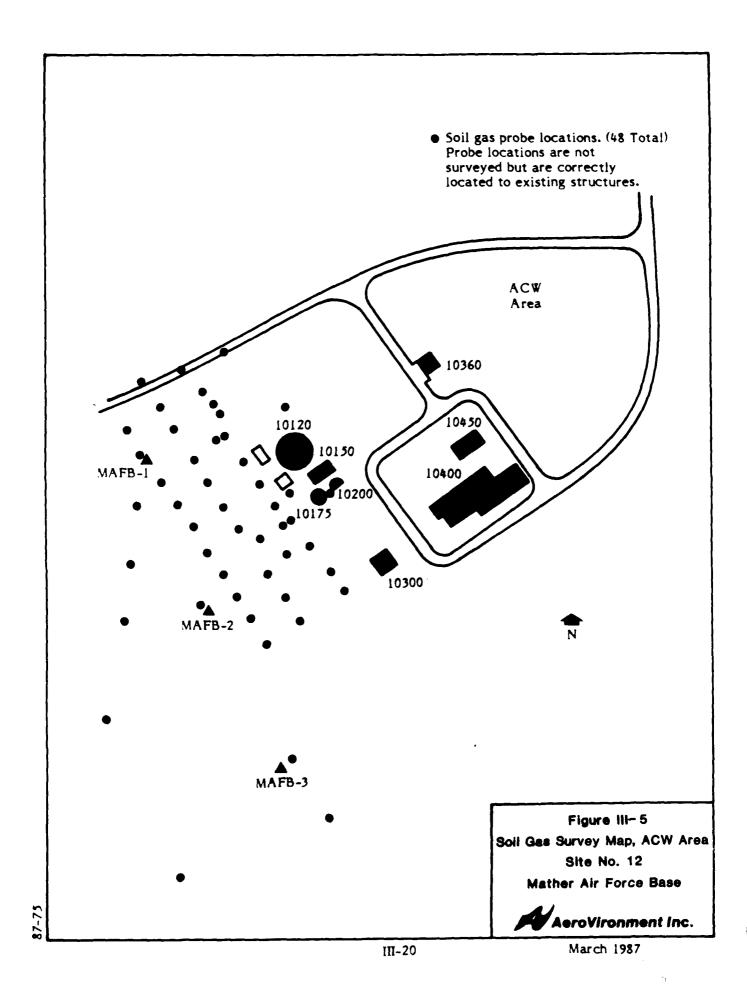
A Goldak Model TR-5 pipe locator was used for final delineation of target locations. Surveying involved sweeping the unit over the area. Instrument output is an audio tone that changes frequency over a metallic object, thus data are not collected directly by the instrument. Instead, we marked areas of interest on a map (see Appendix J) with pinflags for later reference.

5. Soil Gas Survey

Tracer Research Corporation (TRC) conducted a soil gas survey at the ACW area to define the plume of TCE downgradient and to place monitoring wells in the best locations to monitor the contaminant (see Figure III-5). Portions of the borrow pit just off base at the 7100 Landfill area were also surveyed after a suspicious area (approximately 1/2 acre) of the pit was seen to contain empty 55-gallon steel drums on the surface and because this area emitted an odor of petroleum products. This area is essentially the same area shown as the geophysical survey area in the pit on Figure III-4.

TRC used an analytical field van equipped with one Varian 3300 gas chromatograph, one Tracer 540 gas chromatograph, and two Spectra Physics SP4270 computing integrators. A gas chromatograph equipped with an electron capture detector was used to analyze TCA, TCE and PCE. The van has two built-in gasoline-powered generators that provide the electrical power (110 volts AC) to operate all of the gas chromatographic instruments and field equipment. A specialized hydraulic mechanism consisting of two cylinders and a set of jaws was used to drive and withdraw the sampling probes, which consisted of seven-foot lengths of 3/4-inch diameter steel pipe fitted with detachable drive points. A hydraulic hammer assisted in driving probes past cobbles and through unusually hard soil.

TRC collected soil gas samples by driving a hollow steel probe from 1 to 5.5 feet into the ground. The aboveground end of the sampling probes were fitted with a steel reducer and a length of polyethylene tubing leading to a vacuum pump. Five to ten liters of gas were evacuated with a vacuum pump.



During the soil gas evacuation, TRC collected samples by inserting a syringe needle through a silicone rubber segment in the evacuation line and down into the steel probe. Ten milliliters of gas were collected for immediate analysis in the TRC analytical field van. Soil gas was subsampled (duplicate injections) in volumes ranging from 1 µl to 2 ml, depending on the VOC concentration at any particular location. Soil gas data are found in Appendix Q.

The investigation resulted in a total of 59 soil gas samples, which were analyzed for the following compounds:

1, 1, 2 - Trichlorotrifluoroethane 1, 1, 1 - Trichloroethane (TCA) Trichloroethene (TCE) Tetrachloroethene (PCE)

None of these compounds were detected in the soil.

6. Laboratory Interface

All samples collected at Mather AFB were analyzed at Acurex Corporation's Energy & Environmental Division. Acurex's Analytical Laboratory is certified by the California Department of Health Services and is a contract laboratory for the U.S. Environmental Protection Agency.

Samples collected at Mather AFB were shipped via Greyhound bus and delivered to the laboratory overnight. Whenever possible, AV contacted the lab the morning after sample shipment to confirm receipt. All chain-of-custody documents were checked against samples received by the laboratory sample custodian, who signed each form and returned them to AV.

AV's field personnel maintained close communication with laboratory personnel throughout the field program: (1) to ensure all samples shipped to the laboratory had arrived in good condition, (2) to coordinate sampling activities with the laboratory to make sure samples were able to be processed within specified holding times, and (3) to identify errors in sampling, preservation or analysis quickly, so that they could be rectified. In addition, AV personnel visited the laboratory on several occasions to meet with laboratory personnel to discuss analytical methods, check on the disposition of samples, resolve potential

problems, verify quality assurance procedures, and validate data reporting. AV continually reviewed analytical data and identified errors and inconsistencies, all of which were quickly resolved by the laboratory. The goal was to produce a data package which was accurate and error-free.

C. Field Instruments (Measuring Devices)

Conductivity measurements were made with a Geonics EM-34 terrain conductivity meter. The instrument's transmitting and receiving coils act as magnetic dipoles. Small amplitude eddy currents are induced in the ground when alternating current is applied to the transmitter coil. The receiver coil detects the secondary magnetic fields caused by the eddy currents. The ratio of the received signal to the transmitter's primary field is proportional to the soil conductivity. Field measurements are rapid, because no direct connection with the ground is required.

The depth of penetration is independent of terrain conductivity and is determined solely by the intercoil spacing and coil orientation. Three fixed spacings of 10, 20, and 40 meters can be used with the coils in the horizontal mode, and the instrument can sense to a depth 1.5 times the intercoil spacing. For the vertical mode, depth of penetration is .75 times the intercoil spacing. The meter's sensitivity is <0.2 micromhos per meter.

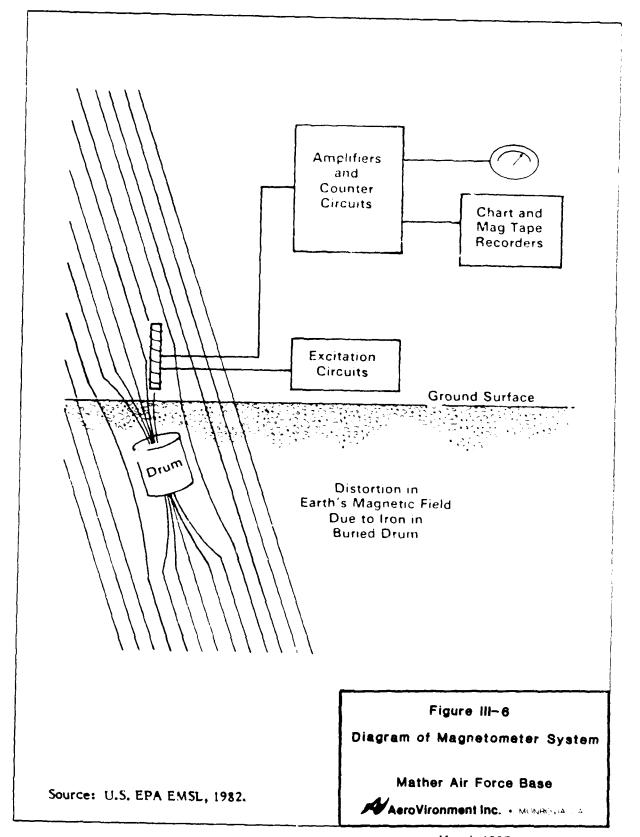
Ground-penetrating radar data were taken with a Geophysical Survey System SIR System 3 ground-penetrating radar. Impulse radar radiates repetitive, short time-duration electromagnetic pulses into the earth from a broad bandwidth antenna placed close to the ground surface. The equipment functions as an echosounding system using radar pulses of only a few nanoseconds to detect and measure the location and depth of reflecting discontinuities in subsurface soils. Continuous profiles are generated by towing the antenna along the profile and displaying the reflected radar signals on a graphic recorder. The effective penetration depth at these sites was between four and six feet.

Magnetic profiling was accomplished with an EDA PPM-500 magnetometer. This device senses pertubations in the earth's magnetic field generated by buried ferromagnetic objects. An induced magnetization is produced in any magnetic material within the earth's magnetic field, and this induced field is superimposed on the geomagnetic field. If strong enough, this induced field produces a localized anomaly in the geomagnetic field (Figure III-6). As the magnetometer is carried across the area of interest, variations in the geomagnetic field affects the movement of subatomic particles within the instrument. From these motions, it is possible to infer the magnitude of the geomagnetic anomaly.

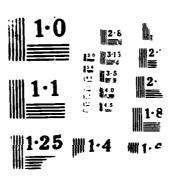
A Goldak Model TR-5 pipe locator was used for final delineation of target locations. Surveying involved sweeping the unit over the area of interest. Instrument output is an audio tone that changes frequency over a metallic object, thus the instrument does not collect or record data.

During the drilling phase, a gas alarm (O₂/explosimeter) was always on site to ensure that the ambient air remained at an acceptable oxygen level. The drill hole and drill cuttings were monitored with an organic vapor analyzer (OVA) that measures the presence of organic vapors. The Gastech Protector Model 1562 Portable Gas Alarm used during this phase of the Mather AFB project can detect and indicate combustible gas concentrations up to the lower explosive limit. If the gas concentration exceeds a preset level, it emits a characteristic audible signal. It also analyzes for oxygen over the range of 16 to 22% and emits a different signal if the oxygen concentration drops below a preset level. Combustible gas is detected by a diffusion head containing a catalytic element. Oxygen is detected by an electrochemical oxygen cell installed in the same head with the combustibles detector.

The Foxboro Century Model 128 organic vapor analyzer (OVA) portable flame ionization detector used is sensitive to organic vapors delivered to it by means of a diaphragm pump. It is extremely sensitive and monitors total organic vapors to parts per million (ppm) levels. The detector is composed of a hydrogen delivery system, a sample delivery system, and an electronic amplification and display system. In the survey mode, the air sample is delivered continuously to the



2/10 UNCLASSIFIED F/G 24/4



detector chamber. When an organic vapor is exposed to the hydrogen flame via the air flow, the molecules ionize and a current is carried between the detector electrodes. The current is proportional to the concentration of the vapor in the sample. Different compounds will ionize to varying extents in the flame, so the meter's response for a given compound is expressed relative to a standard (methane). The OVA was calibrated on a daily basis, using a known methane standard and background air.

The Powers Electric Company Well Sounder is a 200-foot probe cable labeled at 5-foot intervals to monitor the depth at which the top of the water table is encountered. The end of the cable consists of two electrical probes connected by one foot of lead weights. When both probes are submersed in groundwater, an electrical circuit is completed and the meter registers in milliamperes.

During groundwater sampling, pH and conductivity meters were used to characterize the sample water. The Orion Research Model 211 digital pH meter uses a combination electrode probe to determine the acidic or basic properties of the sample water. The system was calibrated daily with two buffer solutions and the probe was decontaminated with deionized water after each use.

The Horizon Ecology Type 1840-10 conductivity meter, a self-contained dip-style probe with tungsten electrodes, measures total ionized substances in solution. The meter displays conductivity from 0 to 20,000 micromhos/cm in five ranges. The temperature compensation is automatically corrected to 20°C by an internal thermistor network in the probe. It was decontaminated with deionized water after each use.

The Geotech 2.4-liter barrel filter is a pressure filtration unit that filters all particles of sizes down to 0.45 microns. During filtration, the barrel is sealed and gradually pressurized to pressures not exceeding 40 psi. Before reaching the 0.45-micron filter, the sample goes through a fiberglass prefilter to sieve out large particles. This instrument was decontaminated after every use.

D. Daily Activities

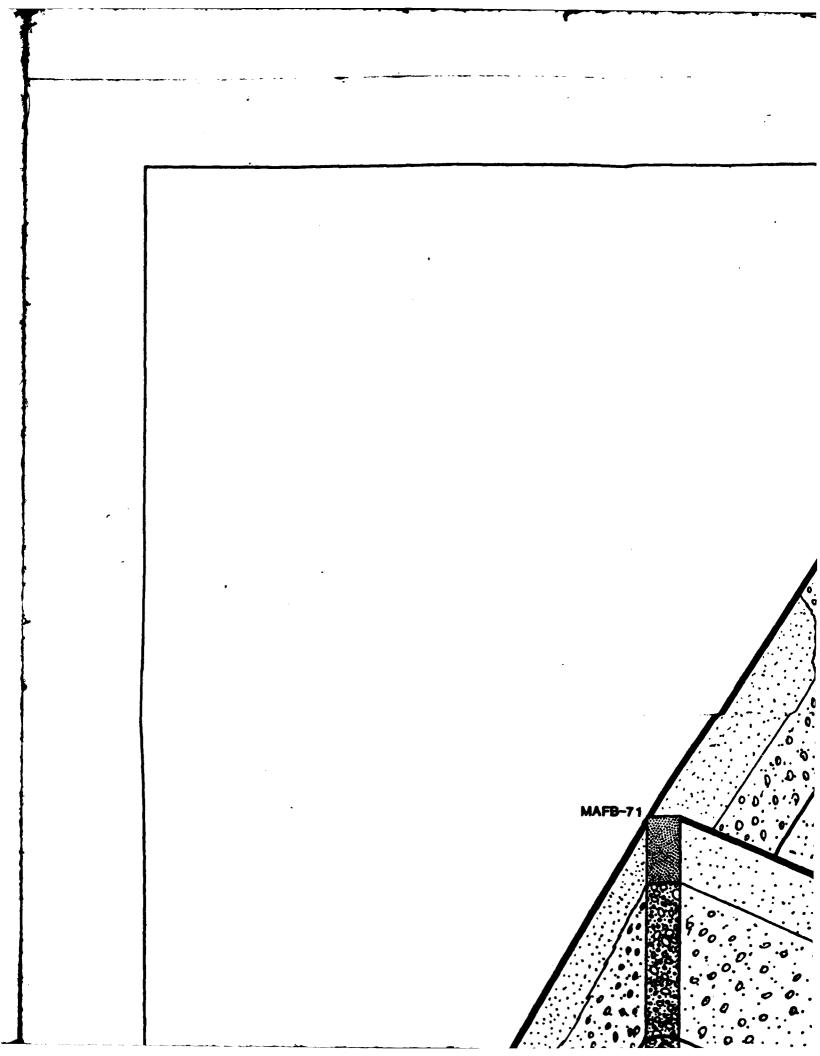
The daily activities are summarized in Table III-1 and Table III-4. A more detailed daily log is found in Appendix L.

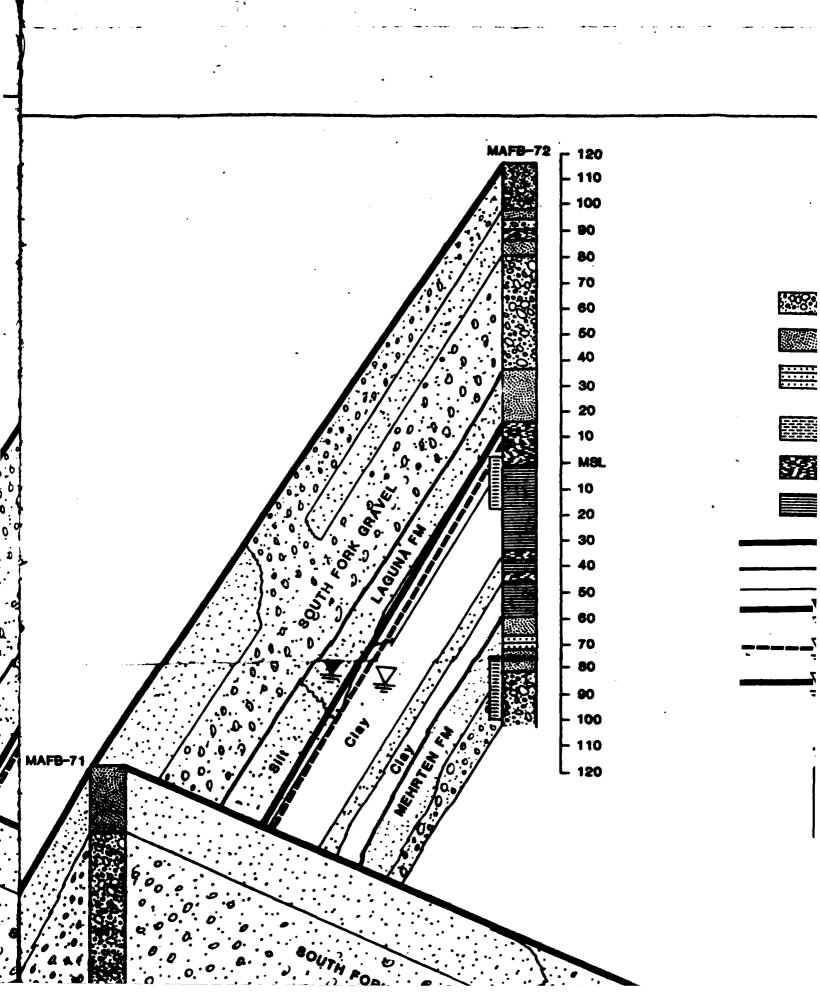
E. Quality Assurance Program

To assure the quality of the measurement data, a sampling and analysis quality assurance/quality control (QA/QC) program was implemented. The objectives of this program were:

- o To monitor the precision of the sampling program by comparing blind field duplicate data with laboratory duplicate QC data.
- o To monitor the integrity of the analytical data. Field quality control samples were blind in order to eliminate the potential for laboratory bias.
- To monitor the sampling methods for evidence of sample contamination through the use of field blanks.
- o To identify and minimize sources of error in the sampling program.

A more complete description of the quality assurance program is found in Appendix M.





Gravel Sand Interbedded Silt and Sand or Silty Sand Silt Silty Clay Clay **Ground Surface Formation Contacts Lithologic Contacts** Water Level in Unconfined Aquifer Piezometric Surface in Confined Aquifer Perched Water MSL: Mean Sea Level Dimensions are in feet above and below mean sea level; Inferred finding, data do not extend to this point Well Screen: Screened intervals in adjacent shallow and deep wells are represented by two screen symbols on one column.

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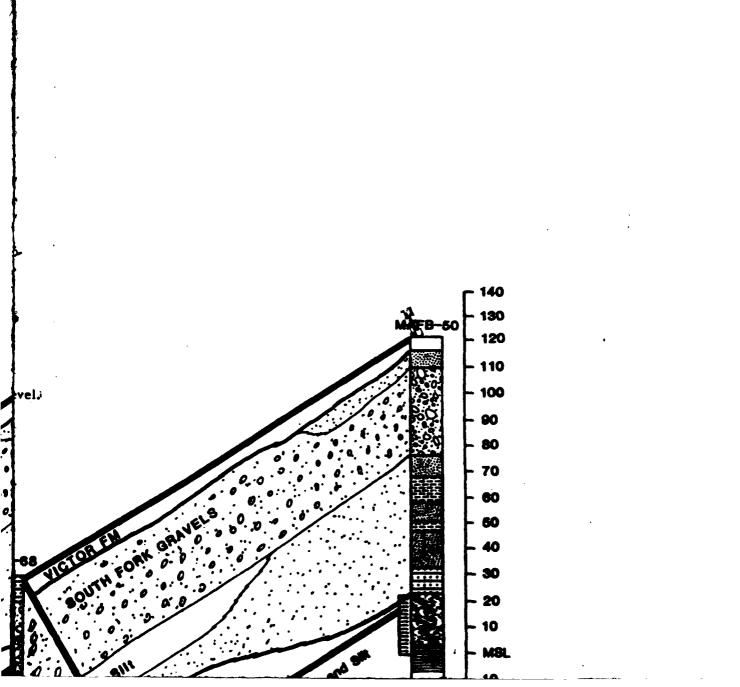
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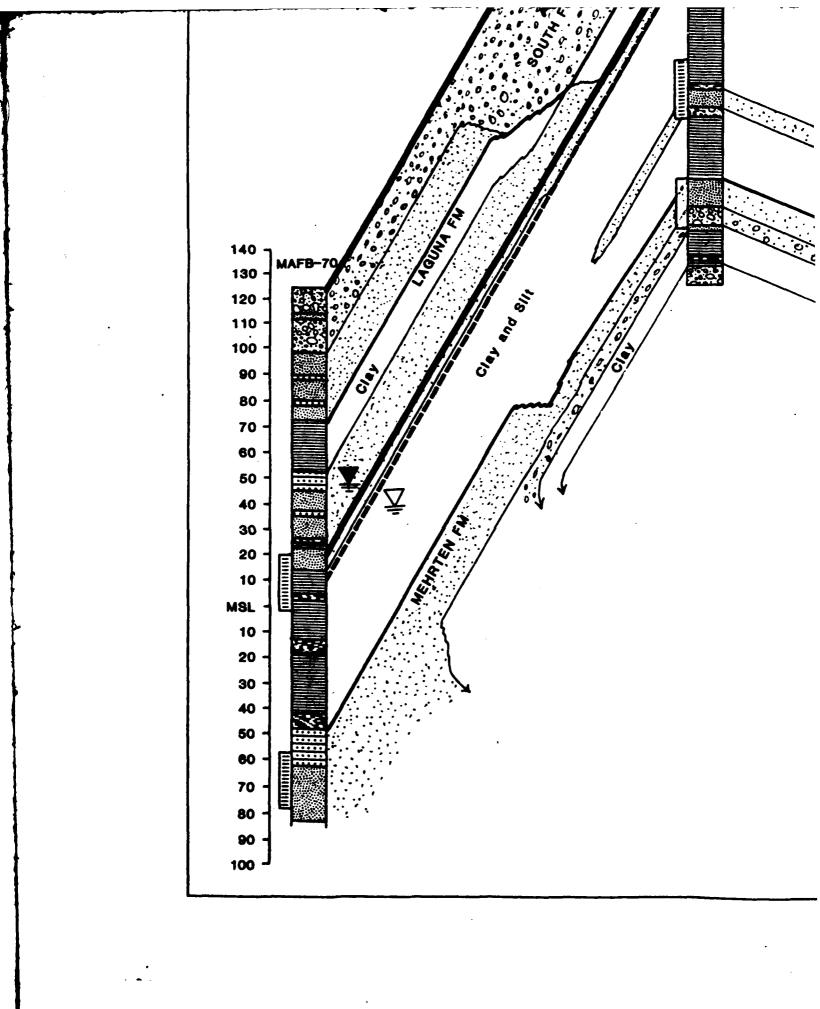
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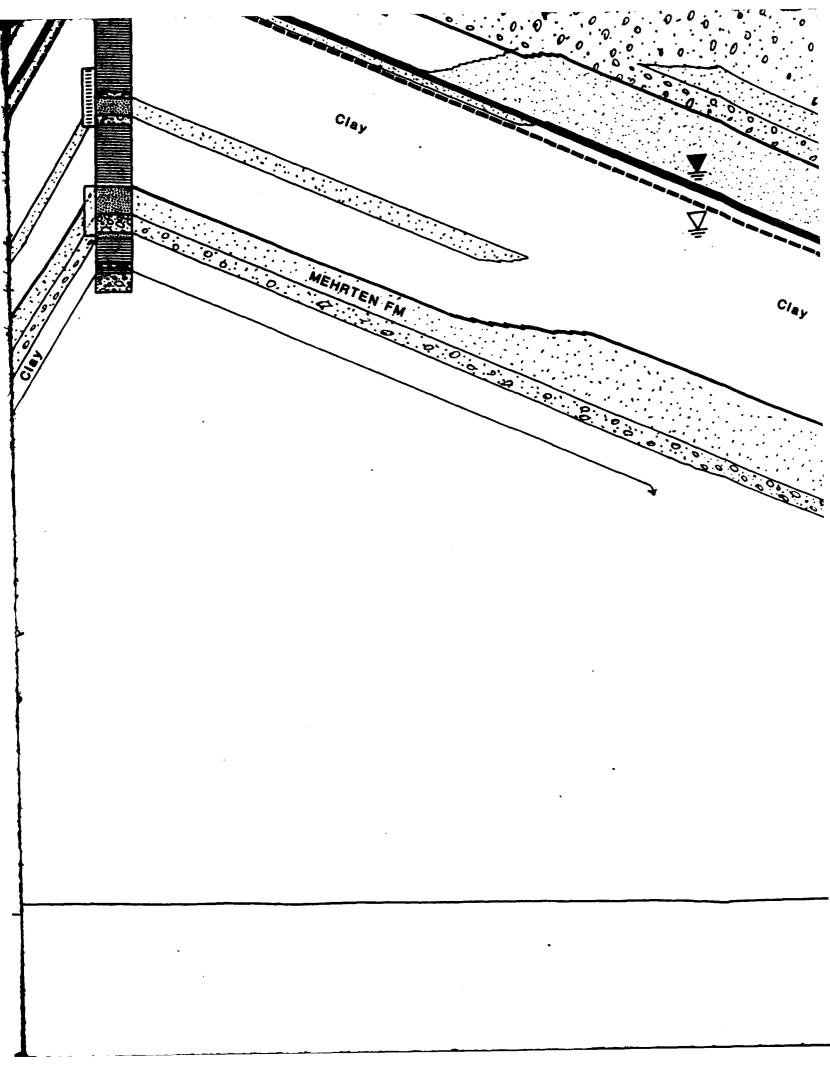
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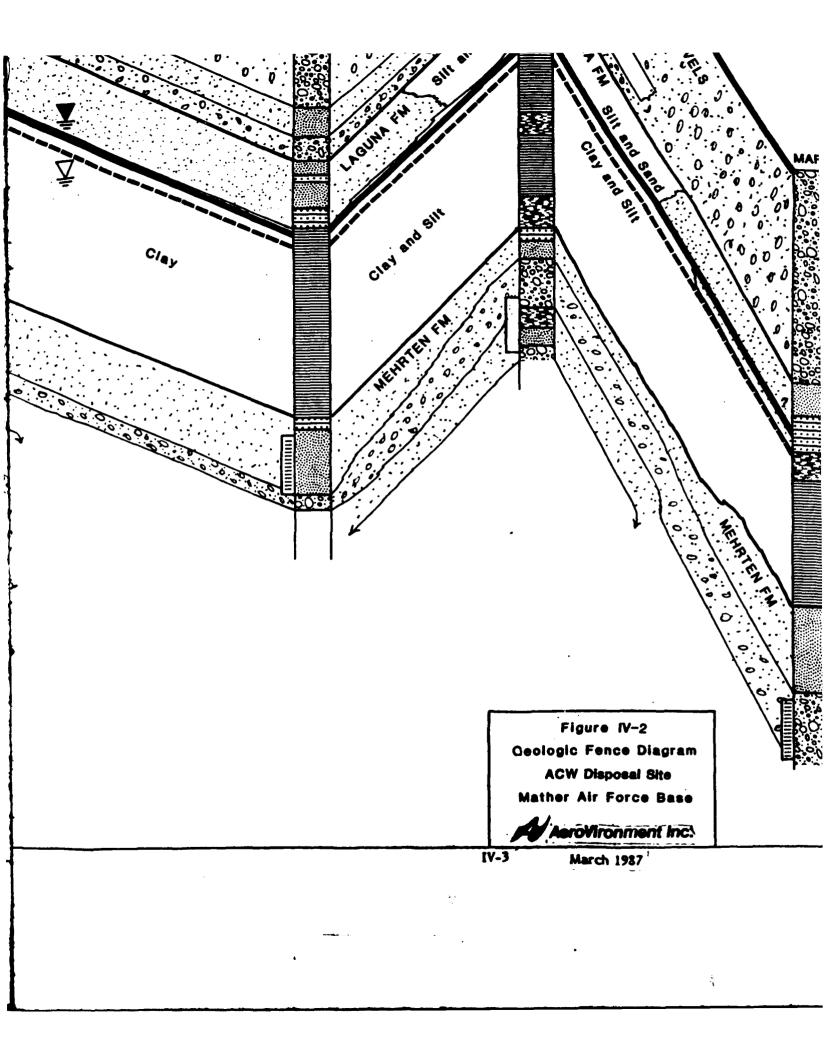
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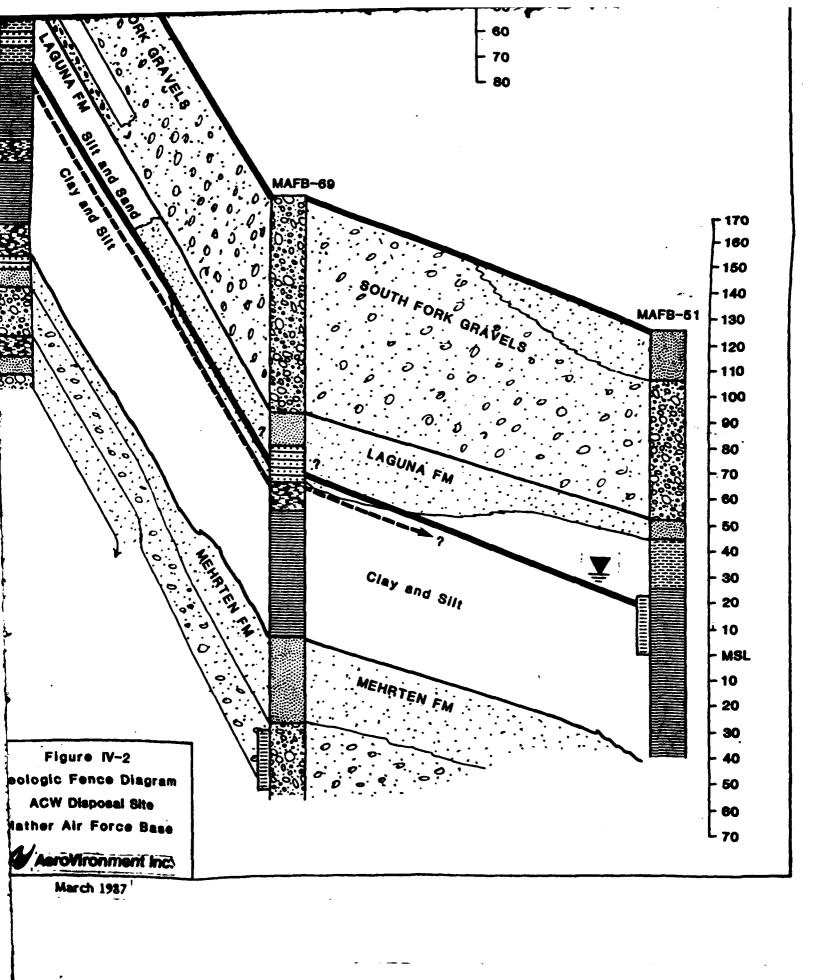
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IV. DISCUSSION OF RESULTS AND SIGNIFICANCE OF FINDINGS

A. Discussion of Results

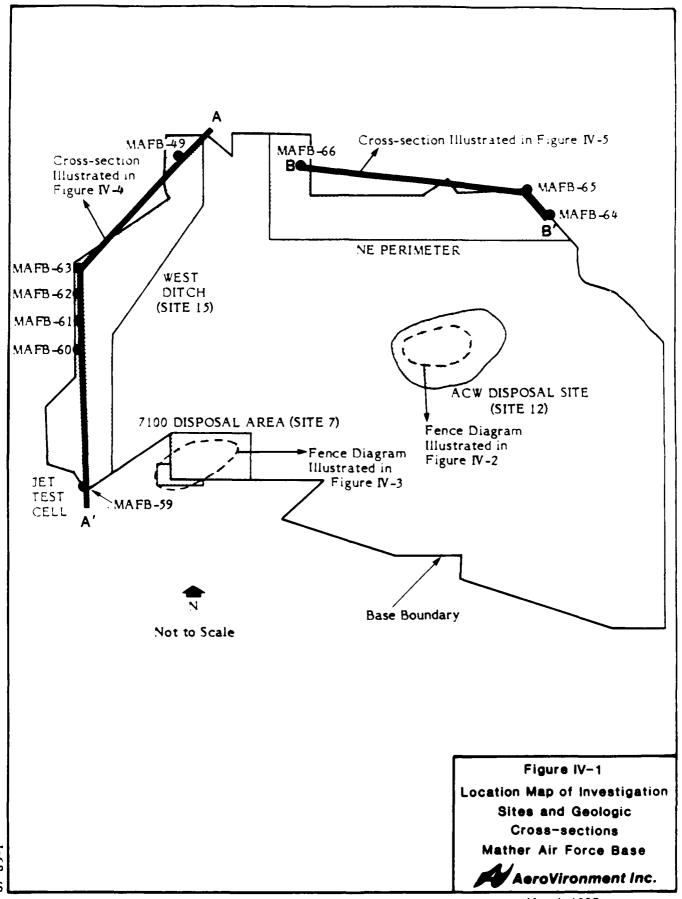
1. Geology

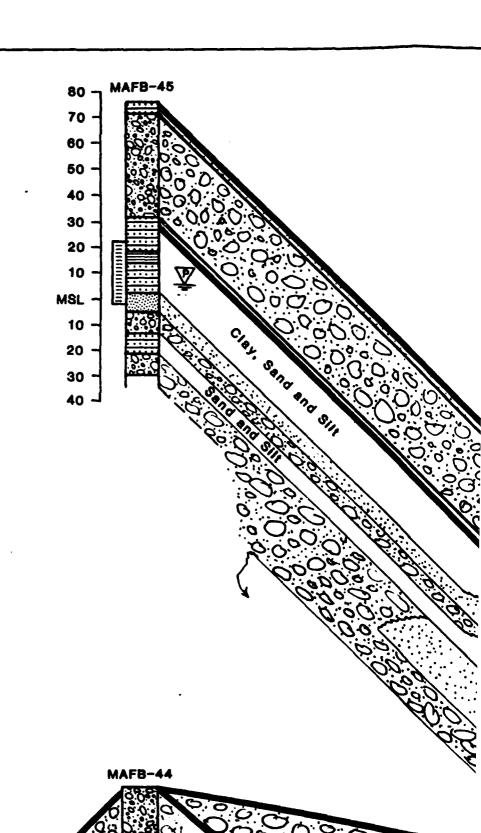
Mather AFB is on the eastern edge of the Sacramento Valley. The terrain is gently rolling hills with elevations ranging from 60 feet above sea level in the southwest to 160 feet in the northeast. The formations encountered during our drilling program were deposited as outwash from streams that originated in the Sierra Nevada Mountains to the east (CDWR, 1978). They gently dip toward the center of the valley to the west.

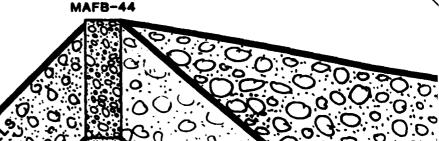
Cross-sections and fence diagrams (three-dimensional cross sections) have been generated from the drilling data to illustrate the stratigraphy found beneath the base. Figure IV-1 shows the locations of the sections drawn for Mather AFB; Figures IV-2, IV-3, IV-4 and IV-5 are the cross-sections themselves. The cross-sections were drawn using information from the boring logs included in Appendix D.

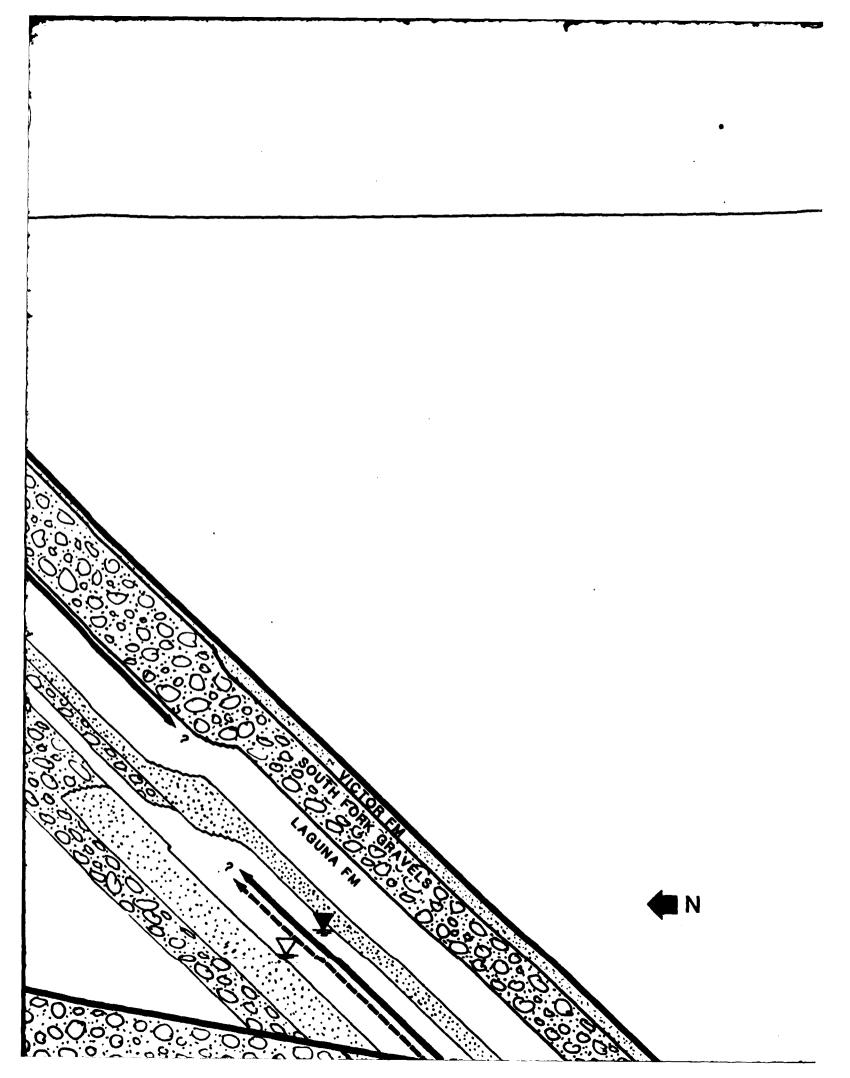
The uppermost unit is the Victor Formation. It is an unconsolidated conglomerate with variable amounts of clays, silts, and gravels. Generally, it is present as silty sands and gravels with occasional clay or gravelly clay zones. The Victor Formation was found in the western half of the base, and isolated outcrops were found in the northeast corner. In most areas, a hard pan had developed two to three feet below the surface. This greatly reduces the potential for infiltration of water from the surface except in areas such as landfills, where the ground has been disturbed.

The South Fork Gravels are ubiquitous at Mather AFB. These gravels, found directly beneath the Victor Formation, were deposited by the South Fork of the ancestral American River (CDWR, 1978). As the name suggests, the material is mainly pebble to cobble size with medium to very coarse sand. Occasional zones of cemented sands were found in with the gravels, which may



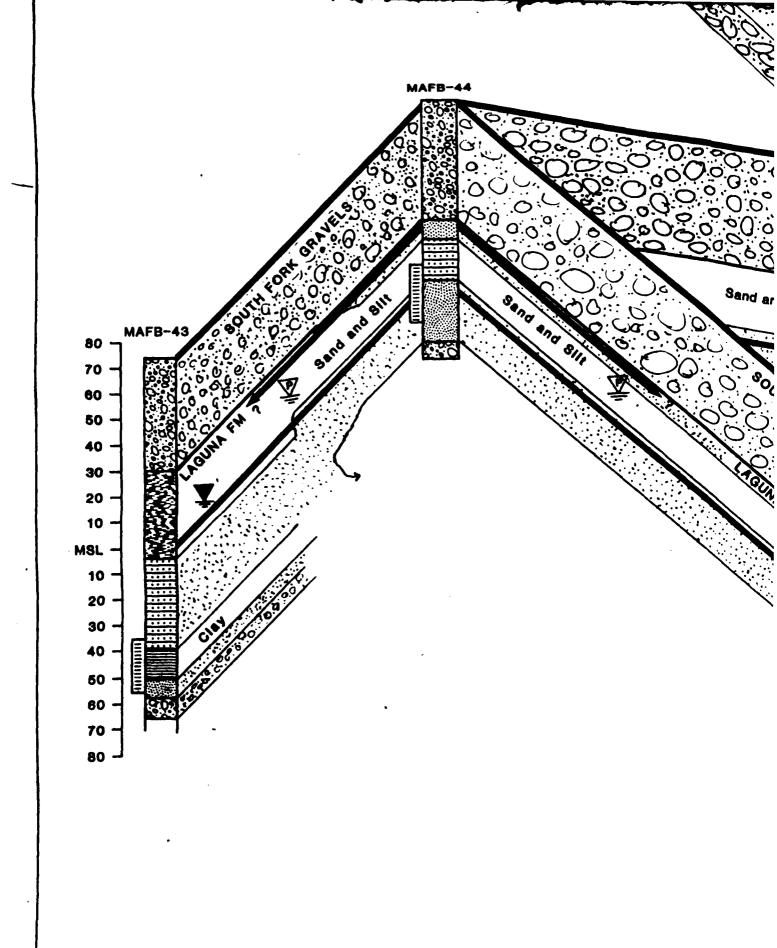


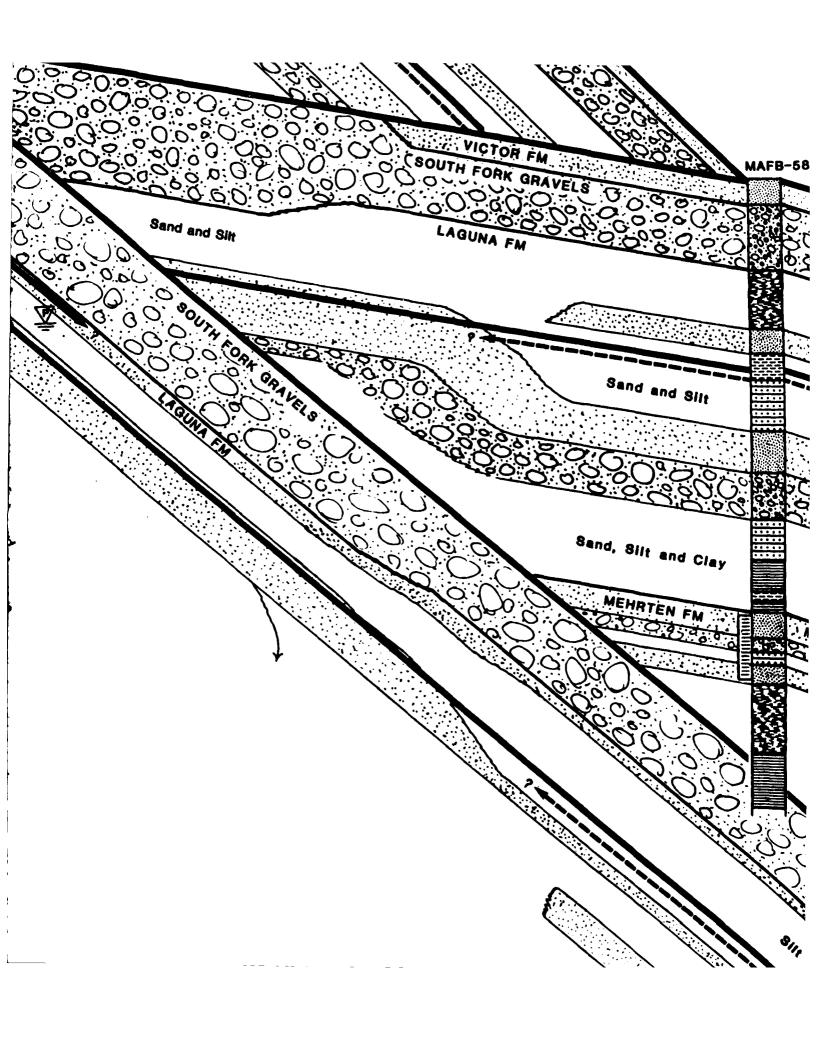


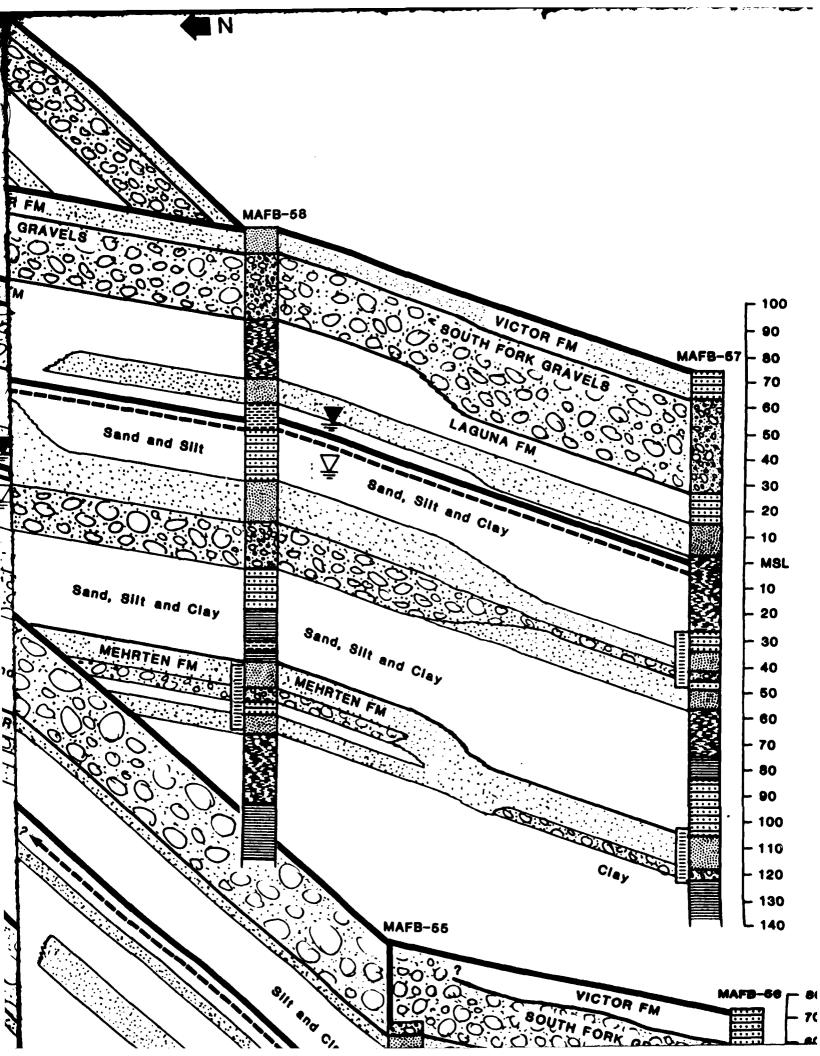


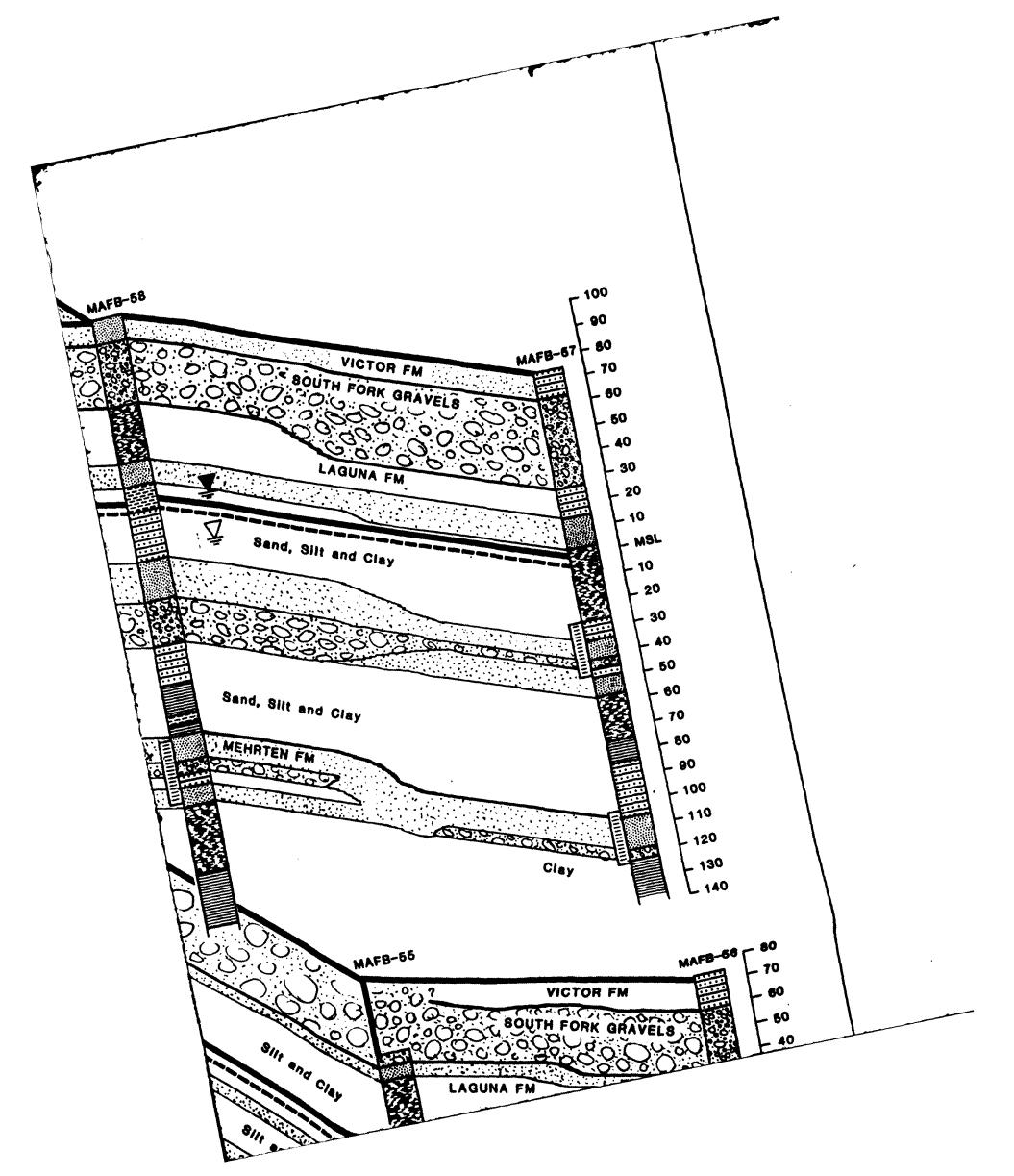
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MAFB-58









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Gravel



Sand



Interbedded Silt and Sand or Silty Sand



Silt



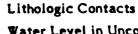
bilty Clay



Clay

Ground Surface

Formation Contacts





Water Level in Unconfined Aquifer



Piezometric Surface in Confined Aquifer



Perched Water



? (=) MSL: Mean Sea Level

Dimensions are in feet above and below mean sea! Inferred finding, data do not extend to this point.

Well Screen:

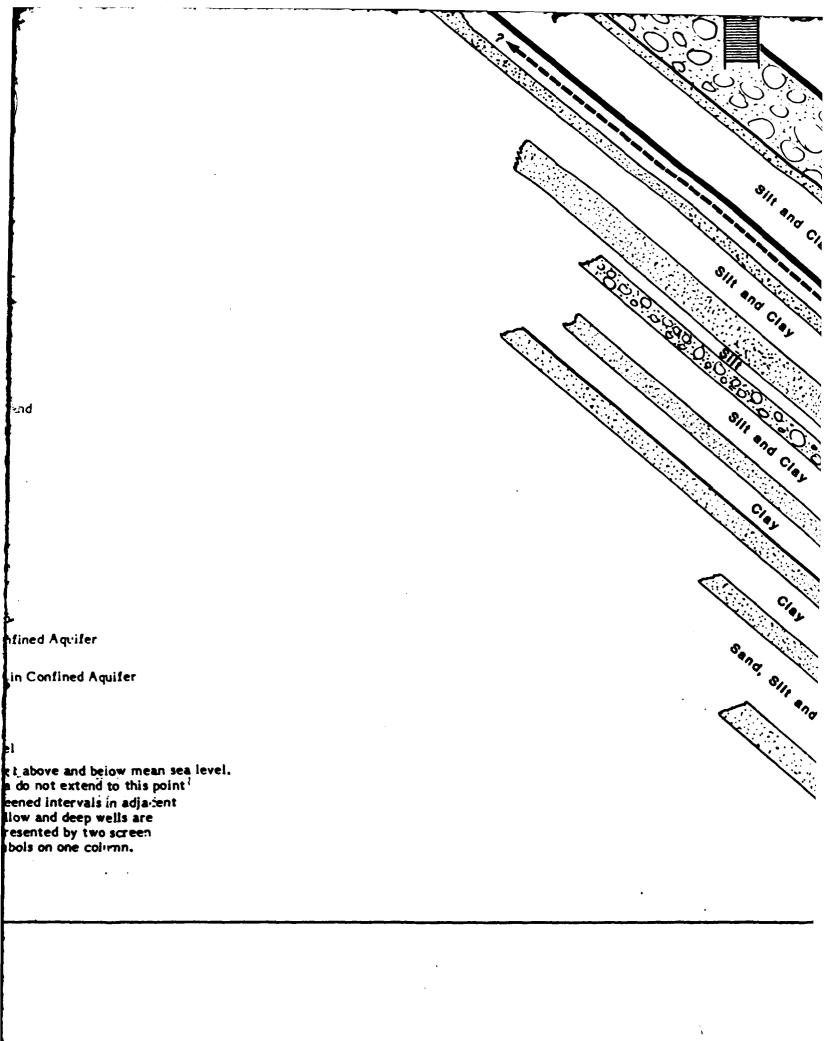
Screened intervals in adjacent shallow and deep wells are

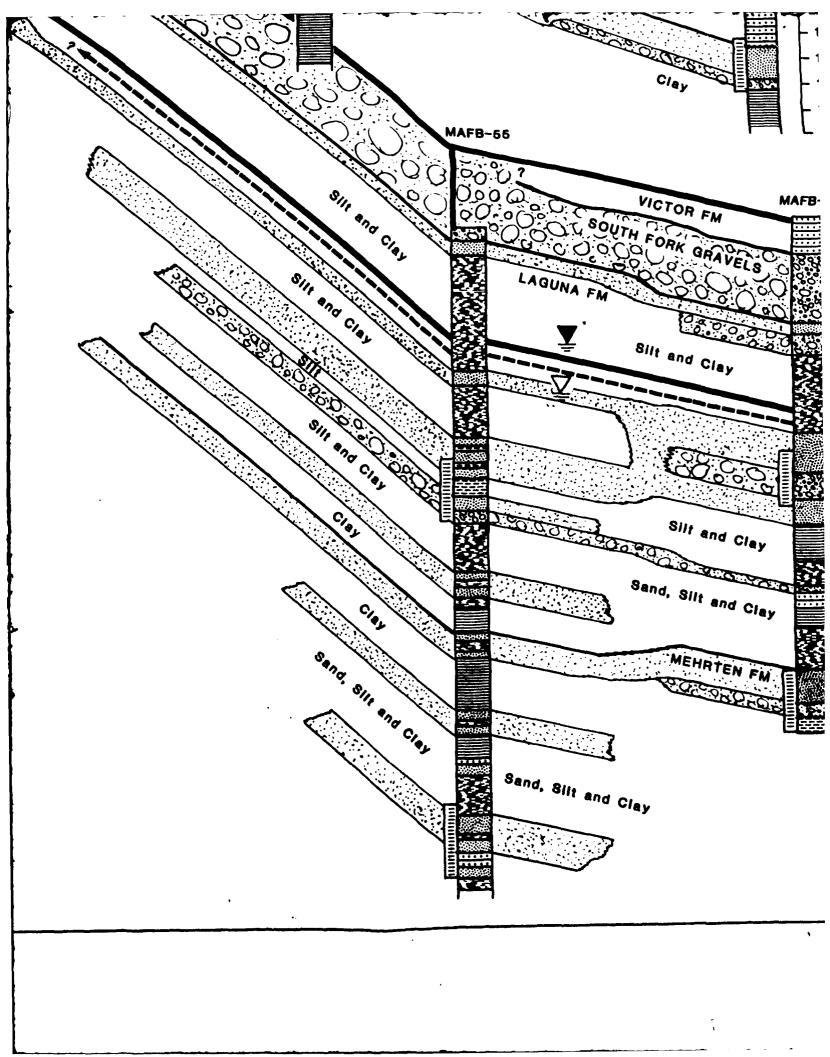
represented by two screen symbols on one column.

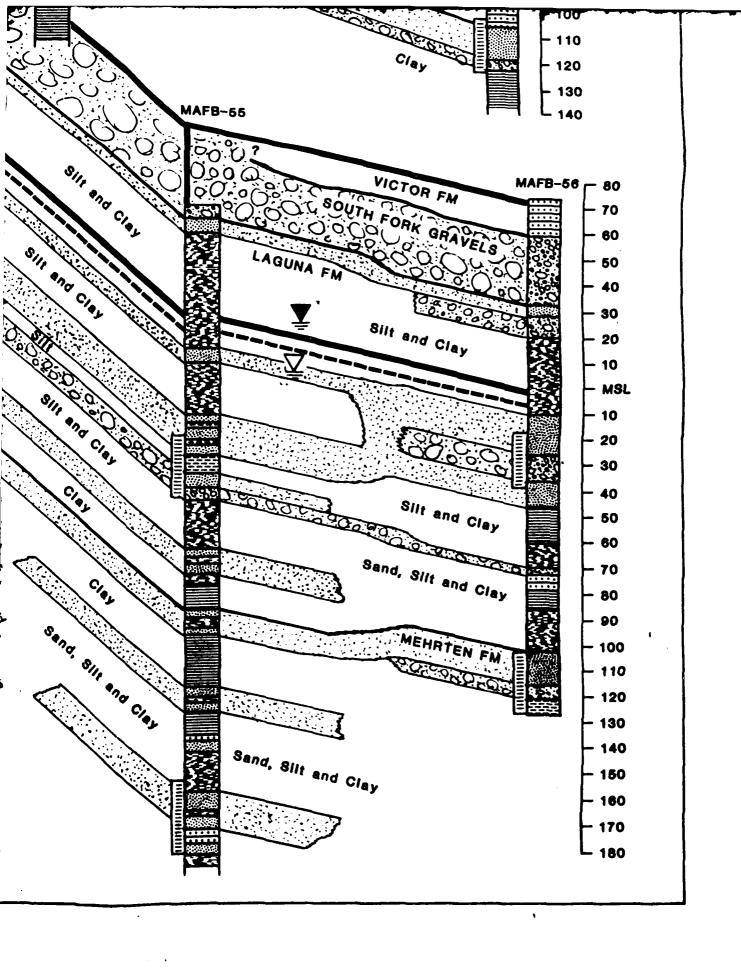
Figure IV-3
Geologic Fence Diagram
7100 Disposal Area
Mather Air Force Base

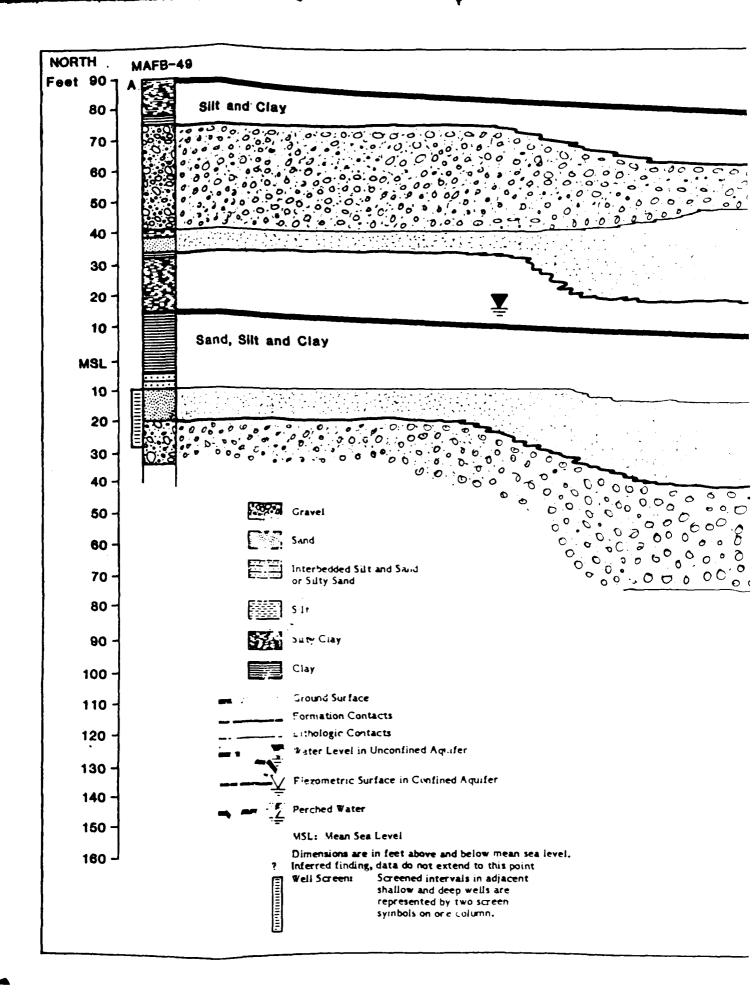


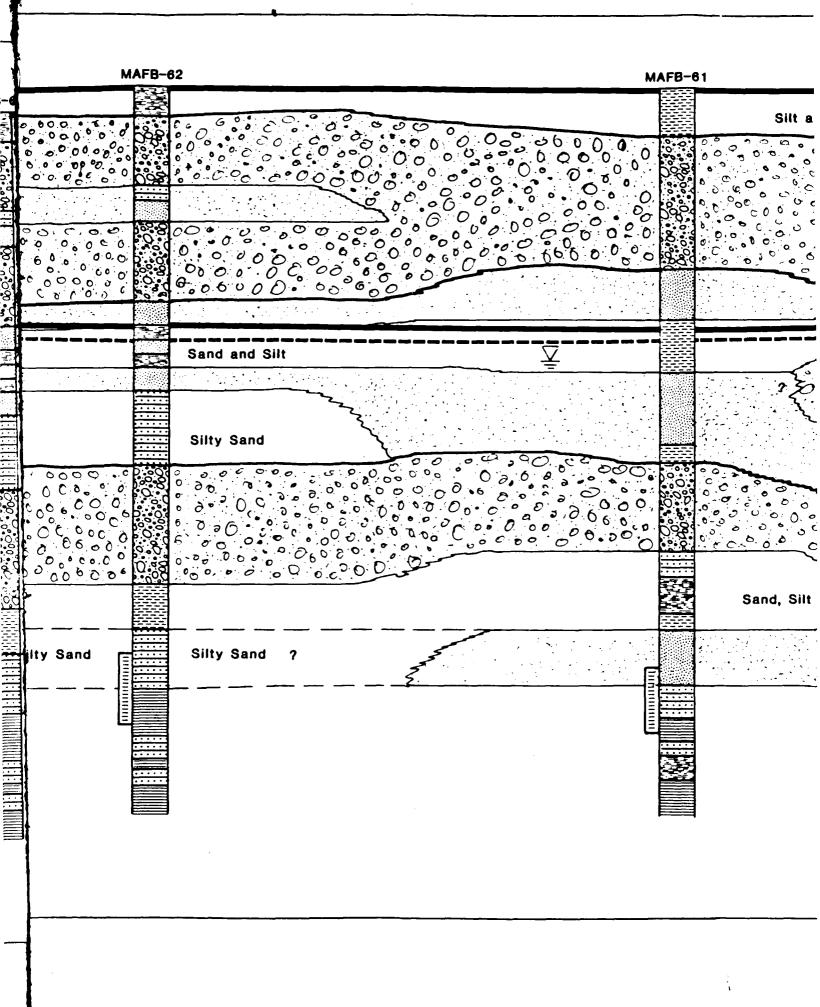
March 1987| 1V-5

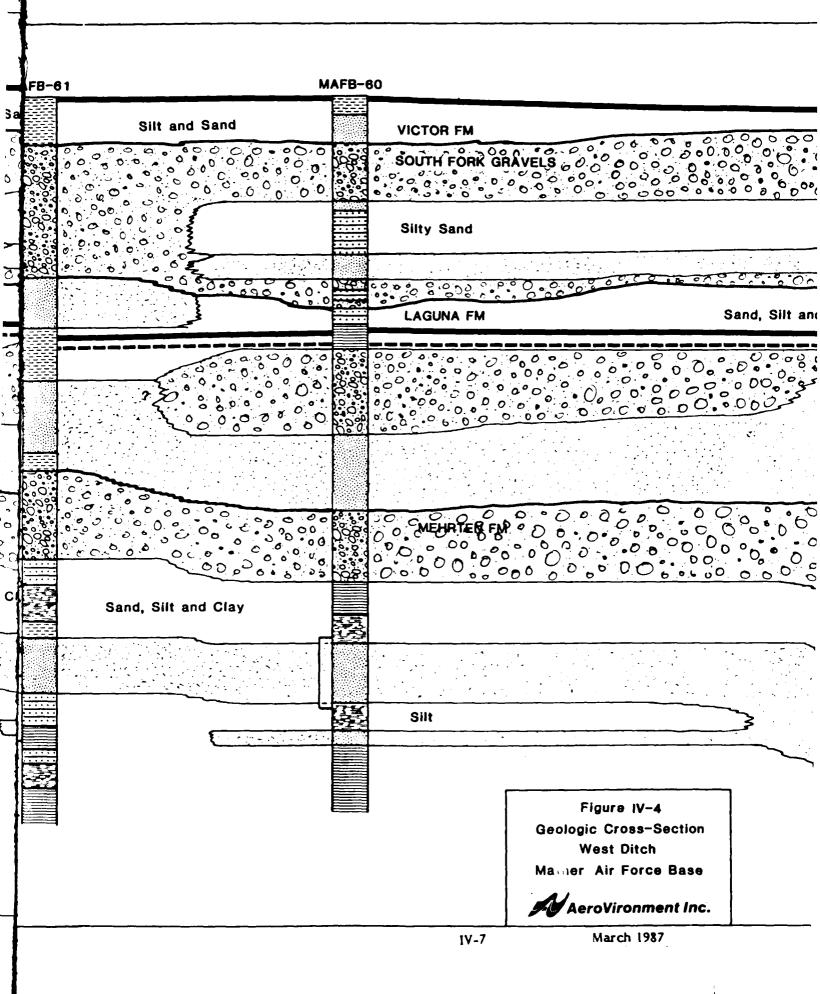


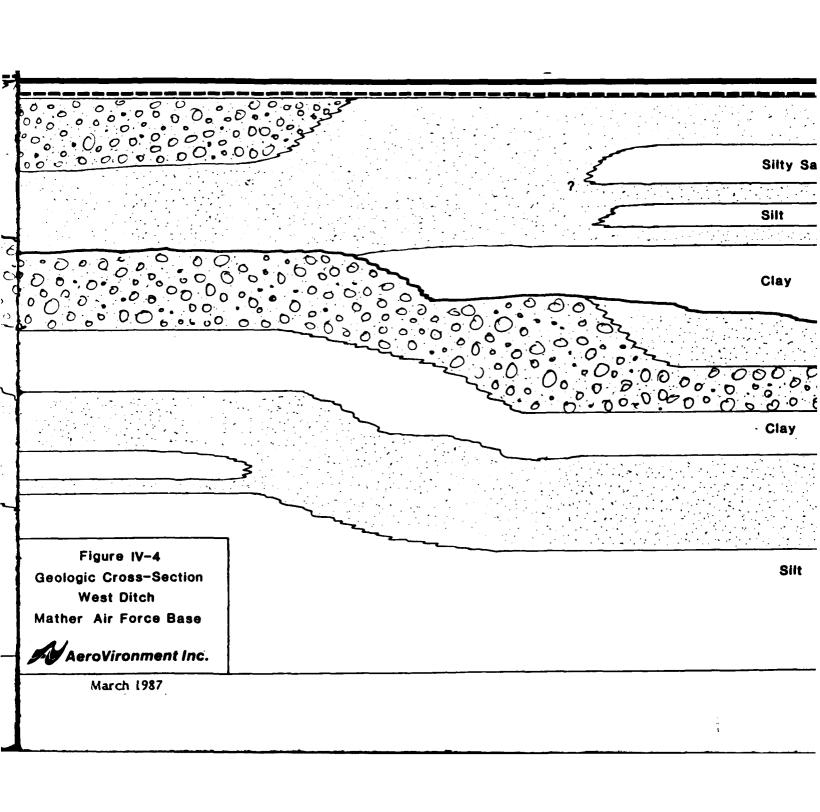


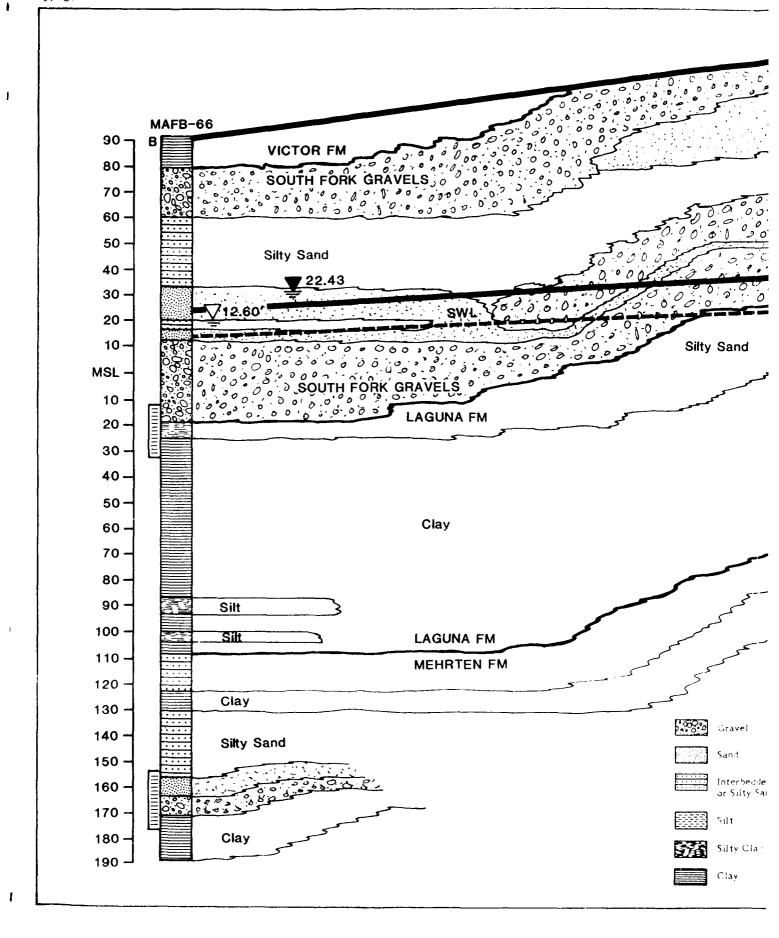


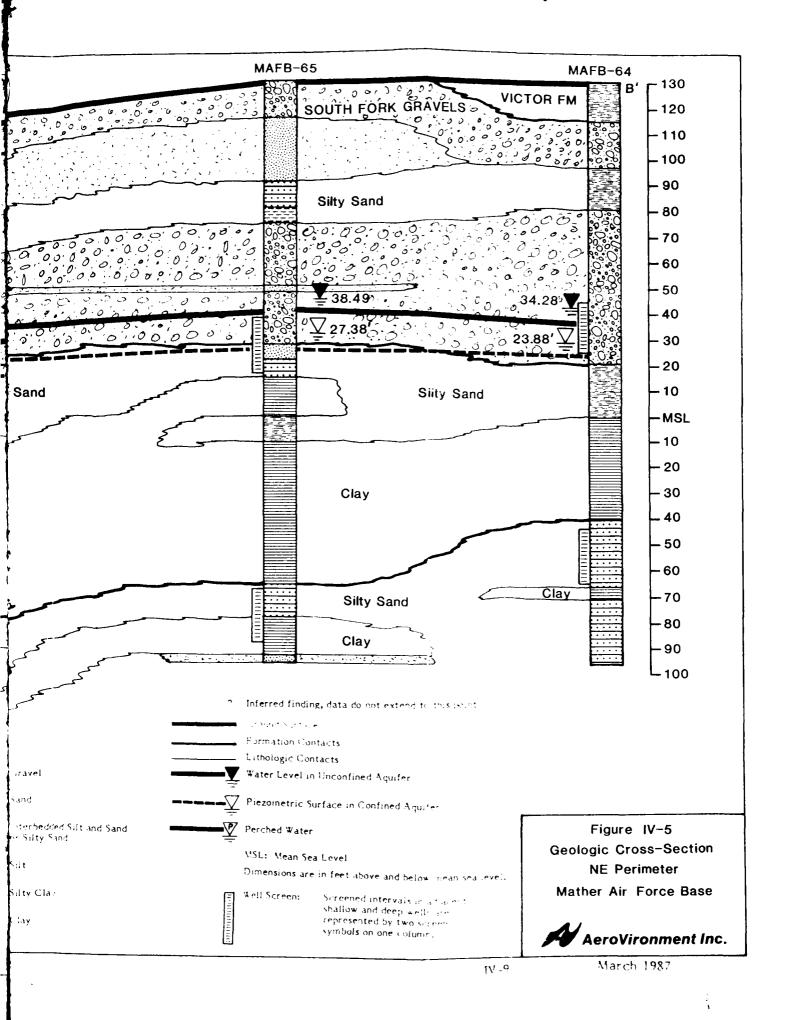












limit percolation of surface water in some areas. Little silt or clay is found in this unit.

In addition, a major set of buried stream channels known as "the superjacent stream channel deposits" run northeast to southwest beneath the base in the northwest corner and through the east-center of the base (CDWR, 1974). Figure II-1 shows these deposits.

The South Fork Gravels lie directly above the Laguna Formation. The Laguna is a heteorogeneous mixture of interbedded clays, clayey sands, and gravels. The matrix material is clay to silty sand with occasional cementation. Gravel occurs in small stringers.

The Mehrten Formation lies beneath the Laguna Formation. It comprises 20-foot thick, vertically-stacked, fining-up cycles. These cycles grade from basal gravel to sand and to fine-grained material (silt and clay) and are found throughout the base. Fining-up cycles are a vertical change in grain size from coarse- to fine-grained (a full definition may be found in Appendix A). The Mehrten Formation has also been found during drilling at industrial property to the northeast (CVRWQCB, 1986). We penetrated only the upper 100 feet during this investigation.

2. Groundwater

During the field program at Mather AFB, AV installed 36 groundwater monitoring wells. Of these, 18 were screened in the first water-bearing zone encountered, and 18 in the first confined aquifer (generally Mehrten Formation) directly below the first water-bearing zone. After all the wells were completed, measuring points were surveyed to an accuracy of ± 0.01 feet above mean sea level (MSL) by a California-licensed land surveyor. The lateral location was determined to an accuracy of ± 1.0 feet using California state plane coordinates. This information is found in Table O-1 (Appendix O).

Once the measuring points were established, static water levels were measured and a groundwater contour map generated. Water levels were also measured at several wells installed during the Phase II, Stages 1 and 2 IRP efforts, and these were incorporated into our map to provide more complete data on groundwater conditions at the base. Table O-2 shows the static water levels; Figure IV-6 groundwater level information for shallow wells, Figure IV-7 for deep wells.

We found that the water table aquifer generally flows from the northeast to the southwest, approximately paralleling the base runways. The elevation of the top of the water table ranges from 35 feet above MSL at the eastern boundary of the base to -3.5 feet MSL in the southwest corner.

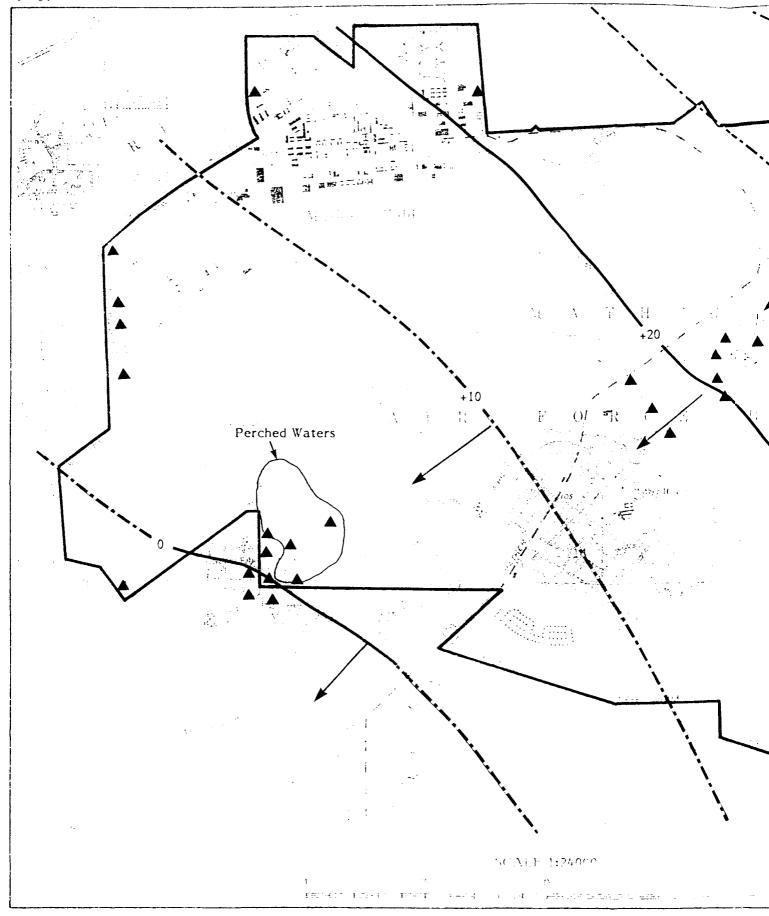
An area of perched water was identified at the 7100 Landfill (Site 7). The elevated water table ranges from +7.38 to approximately +30.0 feet MSL and may be due to a mounding effect created by several sewage oxidation ponds containing standing water at this location. Air Force records indicate that these ponds contain water only during periods of high precipitation. Often, we encountered first water under semi-confined conditions. Water levels in these wells (Table O-2) is not water table in the strict sense, but merely a piezometric surface.

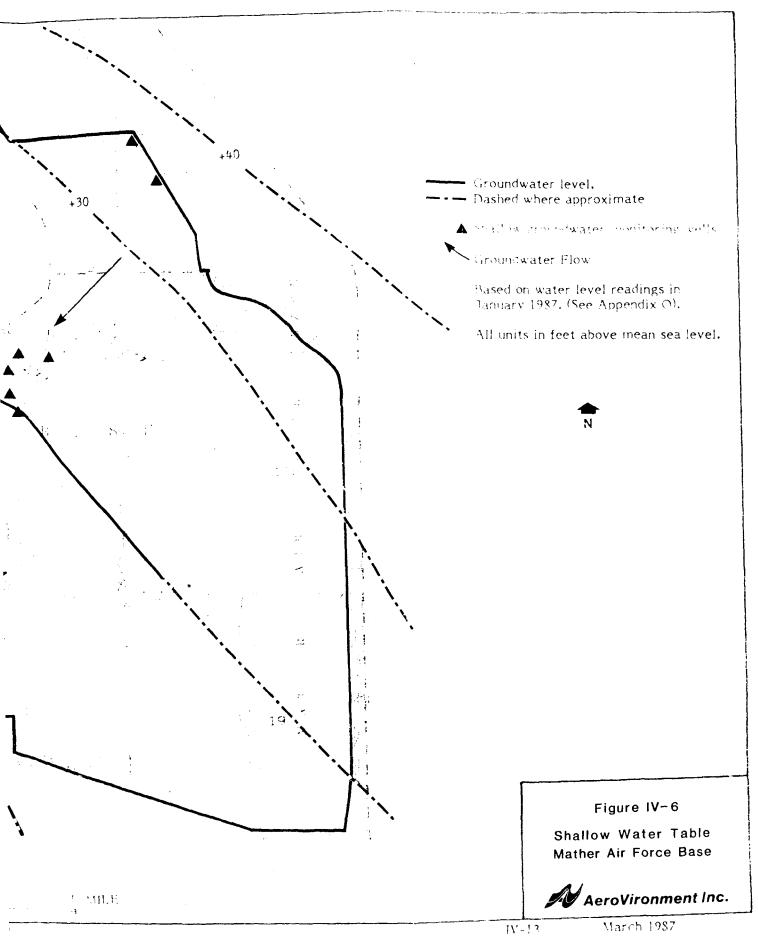
The first confined aquifer (Mehrten Formation) flows east-northeast to west-southwest. Groundwater under confined conditions will rise up above the top of the aquifer when a well is installed. The elevation of water in the well is known as its piezometric surface. The piezometric surface ranges from +26.33 feet MSL at the Northeast perimeter of the base to -7.37 feet MSL in the southwest corner.

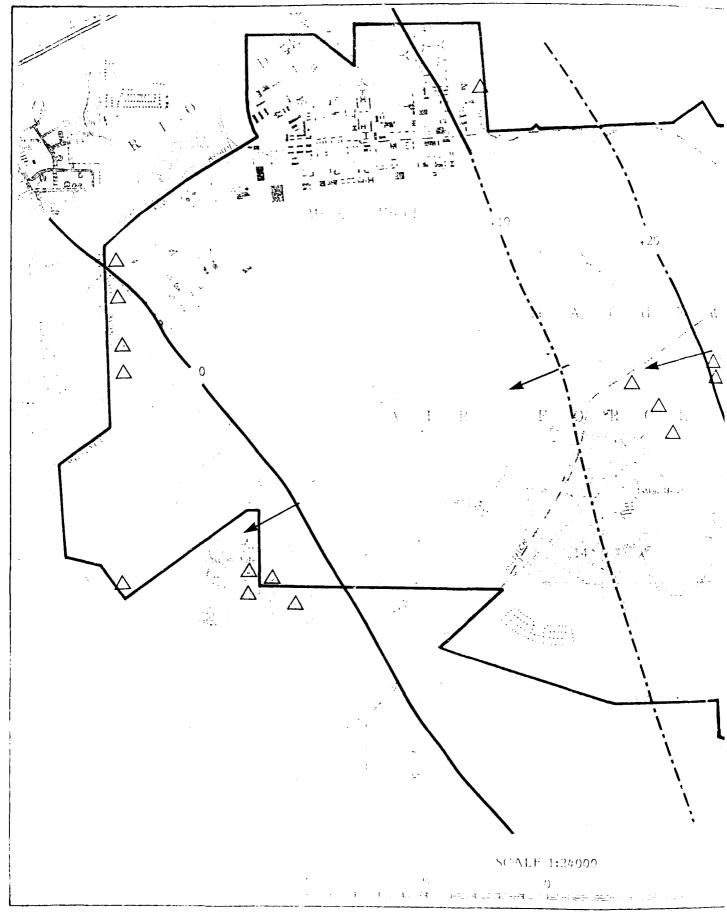
3. Geophysical Data

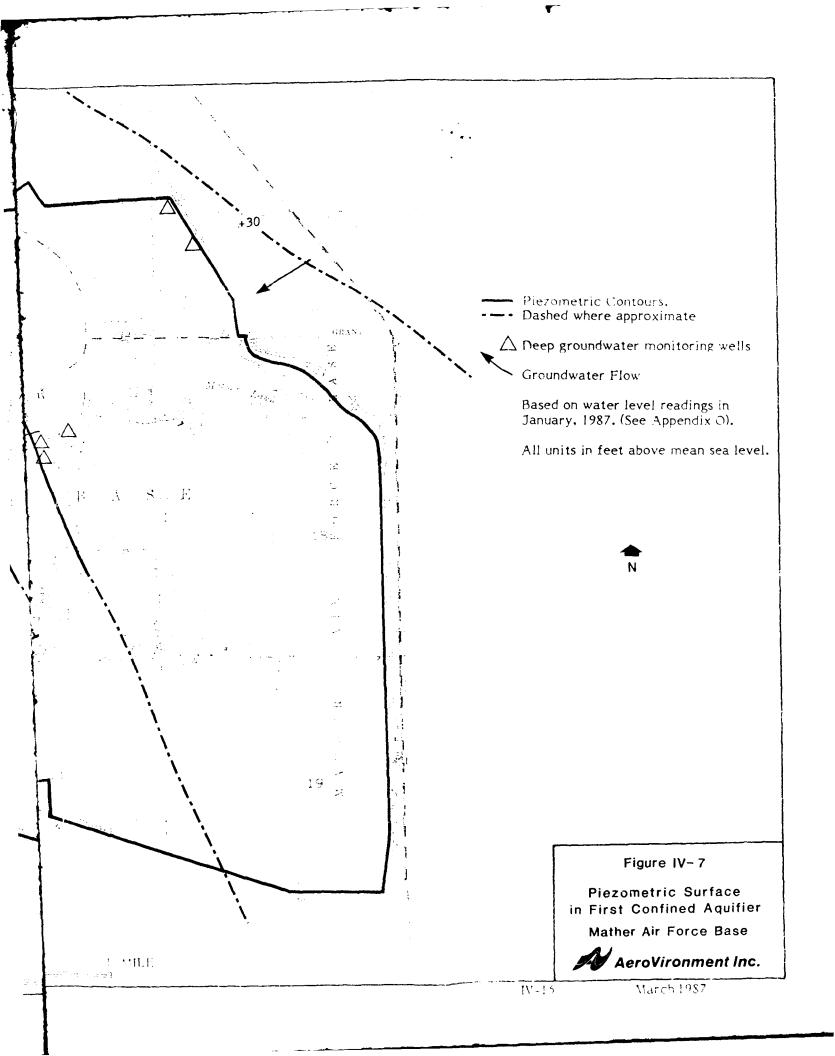
Before drilling, geophysical surveys were conducted at two sites. Surveys at the ACW site (Area 12) used magnetometer, pipe-locator and ground-penetrating-radar instrumentation. The 7100 Landfill site (Area 7) investigation used ground conductivity instrumentation. The geophysical survey program was useful in identifying the presence or absence of shallow plumes of contaminated groundwater, and locating buried metallic objects. Site-by-site results, including figures showing the geophysical anomalies mapped, are given in Appendix J.

1









Results of the geophysical surveys pertinent to locating the monitoring wells are briefly described below.

Area 7 -- 7100 Disposal Area

The western portion of the 7100 Landfill investigation area is downgradient from the actual landfill and displays the highest conductivity, possibly due to solution migration. Monitoring wells were relocated to intercept the groundwater migrating through the areas of highest conductivity.

Area 12 -- ACW Disposal Site

The surface and subsurface of the ACW Disposal Site contain about 12 metal objects as determined by ground-penetrating radar. The pipe locator was used in an attempt to pinpoint several of these objects. A significant pipe locator response was expected if the disposal pipe was within two or three feet of the surface. No such corroborative responses were seen in the study area, probably indicating that the pipe has been removed. For this reason, we did not change the well locations and we eliminated the near-surface excavations from the Stage III work schedule.

4. Soil Gas Survey

At the ACW area a soil gas survey was made to delineate the distribution of TCE first identified in the Phase II, Stage I study in the subsurface underlying the site. The results of the survey were to be used in the placement of monitoring wells. Portions of the borrow pit just off base at the 7100 Landfill were also surveyed because empty 55-gallon steel drums were found in one area of the pit.

A total of 59 soil gas samples were taken. Analytical results are summarized in Appendix Q, which also contains maps of the sampling locations.

The low values for TCE indicate that there is no significant shallow soil contamination at the two sites investigated and thus that the source of the groundwater contamination is not from the shallow soil. For this reason, we

determined the monitoring well locations solely on groundwater flow direction and the suspected location of the ACW disposal pipe as determined by interviews with base personnel.

It is very unusual that soil gas analyses were unable to detect the contamination source. Normally, concentrations greater than 10 µg/L are detectable for many years at source areas large enough to be responsible for groundwater contamination. It is possible that the "disposal pipe" at the ACW site, introduced the contaminant below an impermeable layer, which would account for the lack of detectable soil contamination. It is also possible that the odors in the borrow pit near the 7100 Area were caused by inorganic compounds that could not be detected by the equipment. No soil samples were taken because no contamination was found by the soil gas.

5. Water Sampling Results

Groundwater samples were collected in two rounds from the 35 wells installed during Phase II, Stage 3, from 1 well installed as part of Phase II, Stage 2, and from 8 of the 11 Stage 1 wells. In addition, during the second round, samples were collected from 10 of the 15 base production wells. The first round of samples were collected in November 1986, the second round in December 1986. Tables N-1 through N-54 (Appendix N) show the laboratory results. Table N-55 gives the detection limits for analytical work.

The two sets of analyses for each well provide an opportunity to check that the results are reproducible. Because the samples were taken about 30 days apart, no time-induced changes were likely. In general, the analytical results from the two sampling rounds agree very well. Quality assurance data are presented as part of the laboratory reports in Appendix G; quality assurance/quality control results for the water samples are discussed in detail in Section III.E.

Tables N-1 through N-54 show the first and second round results for each well side by side for easy review (except for production wells, which were sampled only once). The heading for each column shows the sampling round, the sampling date and the sample number used by both AV and Acurex (the laboratory) to track and report the sample results. This sample number corresponds to the sample number shown on the laboratory reports in Appendix G. The tables also

show the results, surrogate recovery (where appropriate) and analysis date for each parameter tested.

All gas chromatographic sample analyses (601, 8020), which had detectable levels of the method analytes were confirmed using second-column GC. The secondary columns used are listed in the analytical reports contained in Appendix G. All second-column confirmations were run within the holding times specified under the methods.

For this investigation, the criteria for establishing the significance of analytical findings took into account the following factors:

- Laboratory or field-induced background contamination, identified using laboratory and field blank samples.
- The limit of quantification (LOQ) for the analyte of interest, which is typically calculated as five to ten times the method's detection limit. The detection limit for each method was calculated by the laboratory as three times the standard deviation of the "noise."
- The reproducibility of the measurements, both within sampling rounds and between rounds.
- The DOHS action levels and EPA Maximum Contaminant Limits (MCLs) for applicable parameters (DOHS, 1986). Parameters for which action levels are not specified are assessed using other accepted water quality standards and available toxicity data (EPA, 1976; DOHS, 1978 & 1984).

In determining whether a finding is significant, after the data have been reviewed for validity (laboratory and field quality assurance/quality control evaluation), the first step is to determine whether a DOHS action level has been established for the parameter. Table IV-1 shows the current DOHS action levels. In some cases, the action level is below the LOQ for a given parameter.

TABLE IV-1. Applicable Action Levels Recommended by the California Department of Health Services, December 1986

Chemical	Action Level [†] parts per billion (ppb)
Purgeable Halocarbons	
Carbon Tetrachloride	5.00 [5.00] 1.00 [5.00]
1,2-Dichloroethane	1.00 [5.00]
Tetrachloroethylene	4.00
Trichloroethylene	5.00 [5.00] 2.00 [2.00]
Vinyl Chloride	2.00 [2.00]
Purgeable Aromatics	
Benzene	0.70 [5.00]
l,2-Dichlorobenzene	130.00 (10)*
1,4-Dichlorobenzene	Limit of Quantification (0.5)
Ethylbenzene	680.00 (29)*
Toluene	100.00

(Action Level for dichlorobenzene is either for a single isomer or for the sum of the 3 isomers)

^{*}Taste and Odor Threshold

[†]Action levels were used for these compounds because they meet or exceed the maximum contaminant levels (MCLs) established by the EPA. The MCLs, when established, are included in brackets [].

For these, the detected concentration must be considered significant, assuming all necessary QA/QC objectives have been met. Results that were not repeatable between rounds but that exceeded DOHS action level for one sampling round must also be considered significant, though inconclusive.

Almost all of the groundwater samples (including the field blank) showed small amounts of methylene chloride. We consider this to be laboratory-induced contamination. Table IV-2 summarizes the results of field blank analyses. The chemicals found in the samples were compared to those found in the blanks. If a chemical in a sample had a concentration at or lower than the concentration found in the blank, we consider it to be either laboratory- or field-induced error. Some compounds were reported at low concentrations on some samples, but were below the LOQ and usually not repeatable. Results that are not above the LOQ of the method (typically 5-10 times detection limits) are not precise and are not considered significant. Results that were not repeatable, i.e., that did not occur in both sampling rounds, are not considered significant unless a DOHS action level is exceeded.

A total of 26 "significant" results were identified in the volatile organics data package for Mather. Table IV-3 shows these. They are also shown as the fraction of the result divided by the California Department of Health Services (DOHS) action level. Of the 26 significant findings, 22, which we derived from 12 monitoring wells and one production well (Housing Well 1), were over the action levels. Trichloroethene (TCE) was found in 10 wells, tetrachloroethene (PCE) in 4, benzene and five other aromatic volatiles in 7, vinyl chloride in 2, and 1,2-dichloroethane in one. Some of the Base Production wells in the housing area generally exceed EPA MCLs for manganese and lead during the bases regular quality checks.

Shallow wells MAFB-1,2,3 and 52 downgradient from the ACW area exceeded the state action level for TCE with concentrations of 790, 35, 130 and 5.7 μ g/L, respectively. In addition, deep well MAFB-70 contained 22 μ g/L benzene (over the state action limit) and 1.6 μ g/L 1,4-dichlorobenzene. Deep well MAFB-71 contained 23 μ g/L xylene.

TABLE IV-2. Summary of Field Blank Contamination

Chemical	Maximum Concentration Found in Blank
Methylene Chloride	9.9 µg/L
Chloroform	4.3 µg/L
,1,1-Trichloroethane	2.5 µg/L
Phenols	.03 µg/L
Barium	.02 mg/L
Chromium	.023 mg/L

TABLE IV-3. Summary of Significant Results

Site No.	Site Name	Well No.	Compound	Results (µg/L)
7	7100	07	None	
7 7	7100	08	Vinyl Chloride	0.7/2.0*
			TCÉ	2.6/11*
			Benzene	1.0/1.5*
7	7100	09	TCE	0.9/3.8
7	7100	40	Benzene	ND/1.1*
7	7100	41	Vinyl chloride	9.9/1.0*
			1,2-Dichloroethane	2.5/ND*
			TCE	22/7.0*
			PCE	2.7/0.6
			1,4-Dichlorobenzene	3.3/ND*
7	7100	42	TCE	13/17*
•	, 100	72	PCE	3.6/2.7
7	7100	43,45	None	
7	7100	46	Benzene	0.9/ND*
, 7	7100	55,58	None	
,	, 100	<i>77</i> ,70	· vonc	
12	ACW	01	TCE	770/790*
12	ACW	02	TCE	23/25*
12	ACW	03	TCE	90/130*
12	ACW	50,51	None	
12	ACW	52	TCE	4.1/5.7*
12	ACW	53,54	None	4.1/ 2./
12	ACW	67,69	None	
12	ACW	70 70	Benzene	ND/22*
12	AC W	70	1,4-Dichlorobenzene	ND/1.6*
12	ACW	71	Xylene	23/9.0
12	ACW	72	None	23/9.0
1 2	ACW	12	None	
15	West Ditch	10,11	None	
15	West Ditch	47	TCE	7.6/36*
.,	west Breen	7/	PCE	2.5/7.7*
15	West Ditch	48,49	None	2.0//./
15	West Ditch	59,62	None	- -
15	West Ditch			(2/1 0#
1)	west Ditch	63	TCE PCE	6.3/1.8*
				12/11*
			Benzene .	ND/0.9*
	NE Perimeter	64,66, 73,75,76	None	
	Production	HW-01	1,2-dichloroethane	2.8*

^{*}At least one sampling round result exceeds the DOHS Action Level for the compound. Refer to Table IV-1 for action levels.

Shallow well MAFB-47 at the West Ditch contained concentrations of TCE (up to $64\,\mu\text{g/L}$ and $18\,\mu\text{g/L}$, respectively, in the second round duplicate sample from this well) above the state action level. Deep well MAFB-63 at the same site contained 6.3 $\mu\text{g/L}$ TCE, $12\,\mu\text{g/L}$ PCE and 0.9 $\mu\text{g/L}$ benzene, all above the action level.

Five shallow wells downgradient from the 7100 Area were found to contain significant levels of contaminants. MAFB-42 contained 17 µg/L TCE and 3.6 µg/L PCE. MAFB-8 contained 11 µg/L TCE, 2.1 µg/L vinyl chloride and 1.5 µg/L benzene. MAFB-40 contained 1.1 µg/L benzene while MAFB-9 contained 3.8 TCE. Finally, MAFB-41 contained 22 µg/L TCE, 2.7 µg/L PCE, 9.9 µg/L vinyl chloride, 2.8 µg/L 1,2-Dichloroethane and 3.3 µg/L 1,4-Dichlorobenzene. In addition, shallow well MAFB-46, located near the Jet test cell, exceeded the benzene standard with 0.9 µg/L.

Base production well HW-01 was sampled only once and found to contain 2.8 µg/L 1,2-Dichloroethane, which is above the state action level. However, a split sample collected and analyzed by the base BEE showed no evidence of 1,2-Dichloroethane. In 13 other sampling events conducted since January, 1985, this contaminant has never again been detected in this well.

sampling. In general, deep wells throughout the base are free of contamination, except for benzene and related compounds found at very low concentrations. The compounds found in the deep wells would normally be considered insignificant because they were found in low concentrations and were not repeatable. However, because of the very low action levels set for benzene and 1,4-Dichlorobenzene, they are listed as significant. Even so, the benzene, dichlorobenzene, ethylbenzene, toluene and xylene found in deep wells is suspect (probably field or laboratory contamination). Only one deep well, No. 63 (West Ditch), showed repeatable significant contamination (TCE and PCE).

The background wells at the ACW and the 7100 area, in addition to upgradient wells along the base's northeast perimeter, showed no evidence of chemical contamination. Thus, the chemicals found in downgradient wells appear to be coming from the sites. None of the chemicals found in shallow wells sampled

23/25 ug/1. 90/130 µg/L

1 MILE

Samples collected in November and December as part of IRP Phase II, Stage 3.

- Shallow wells
- O Deep wells

TCE: Trichloroethene (5)

PCE: Tetrachlorethene (4)

BEN: Benzene (0.7)

VC: Vinyl Chloride (2)

DCA: 1,2-Dichloroethane (1)

4DCB: 1,4-Dichlorobenzene (130)

XYL: Xylene (620)

California Department of Health Services Action Levels in PPB

Figure IV-8 Groundwater Chemistry Results

Mather Air Force Base

AeroVironment Inc.

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in Stage 3 are surprising, based on historical operating procedures and prior sampling. However, the contamination found in base production well HW-01 was not expected. Since split samples collected by Mather's Bioenvironmental Engineer showed no detectable concentration of this contaminant, this result is also suspect.

A review of the inorganics data package found no significant contamination mentioned above. All metal concentrations were below drinking water standards and anions and cations were found at background concentrations. The specific criteria used to evaluate the inorganics results are shown on Table IV-4.

Of particular interest in the inorganics data package are the anion and cation data. Figures IV-9 through IV-13 show trilinear diagrams for the water samples collected from each of the Stage 3 sites plus base production wells. A trilinear diagram is a plot of the major individual cations and anions found in a water sample, as a percent of the total cations and anions (based on milliequivalents). The points on the cation grid and anion grid are then connected on the upper grid, which indicates the predominant chemical constituents of the water (Davis, 1966). Each point in the grid represents one well. The trilinear plots offer a graphical representation of this inorganic chemistry of a specific well relative to that of other wells. Since overlying aquifers typically have characteristically different anion/cation balances, they will produce distinctly different points on the trilinear plots. Water from shallow wells are plotted as asterisks and water from deep wells as triangles. Anion and cation data are presented at the end of Appendix G. The plots show that the water from shallow wells at all sites has a similar geochemistry, primarily calcium-magnesiumbicarbonate. Deep wells were found to yield somewhat different water, being primarily sodium-potassium-bicarbonate. This indicates that there is probably no significant communication between the water in the two aquifers.

No petroleum hydrocarbons, phenols or cyanide were found in water samples from the 7100 Area, which was tested for these parameters.

TABLE IV-4. Summary of Inorganic Water Quality Objectives

Compound/Element	Primary Drinking Water Standard ⁽¹⁾ * (MCLs)
Chloride	250 mg/L (secondary standard
Sulfate	500 mg/L (secondary standard
Nitrate	10 mg/L
Bromide	NA
Floride	1.4-2.4 mg/L
Nitrite	NA
Phosphate	NA
Alkalinity	>20 mg/L (EPA's Quality Criteria for Water)
Calcium	NA
Magnesium	NA
Iron	300 µg/L (secondary standard
Manganese	50 µg/L (secondary standard)
Sodium	NA
TDS	500 mg/L (secondary standard
Hardness	NA
Arsenic	50 µg/L
Barium	1 mg/L
Cadmium	10 µg/L
Chromium	50 μg/L
Lead	50 µg/L
Mercury	2 μg/L
Selenium	10 ug/L
Silver	50 µg/L
Cyanide	200 ug/L

⁽¹⁾ Unless otherwise stated *(EPA, 1976; DOHS, 1978; DOHS, 1984).

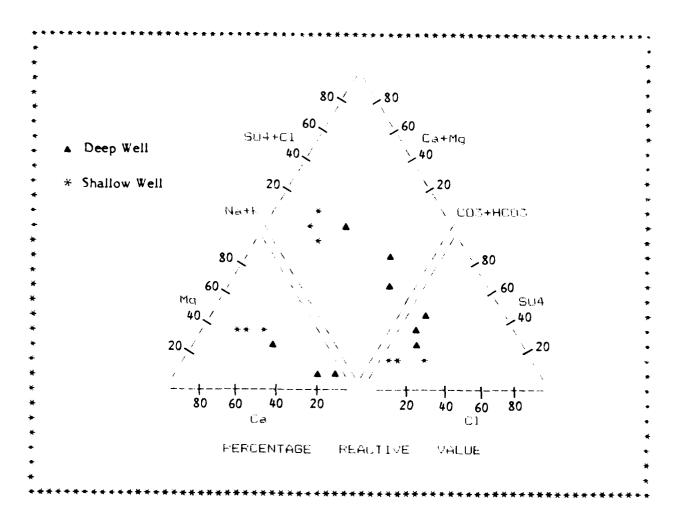


FIGURE IV-9. Groundwater anion/cation balance, Northeast Perimeter Wells

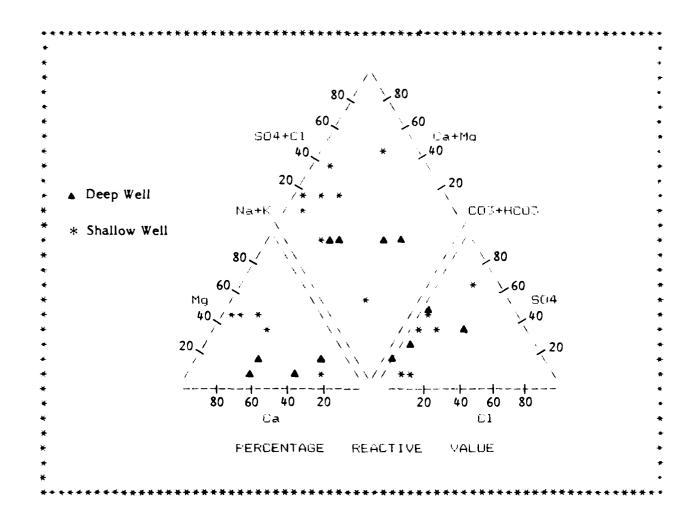


FIGURE IV-10. Groundwater anion/cation balance, 7100 Disposal Area Wells

7-372

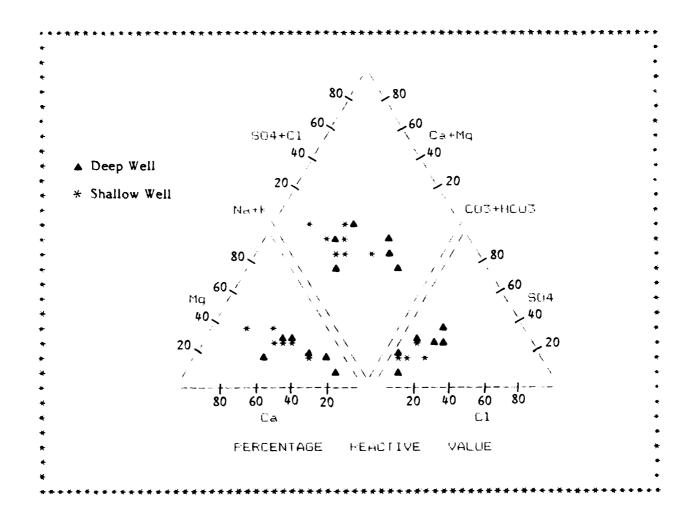


FIGURE IV-11. Groundwater anion/cation balance, ACW Disposal Site Wells

87-373

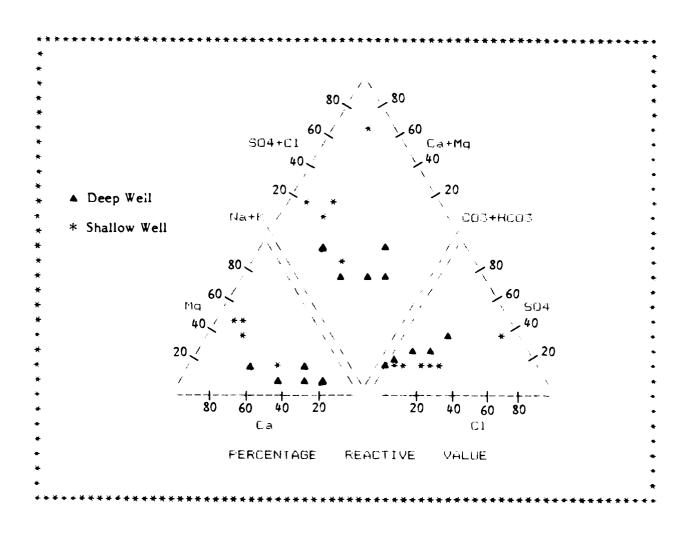


FIGURE IV-12. Groundwater anion/cation balance, West Ditch Wells

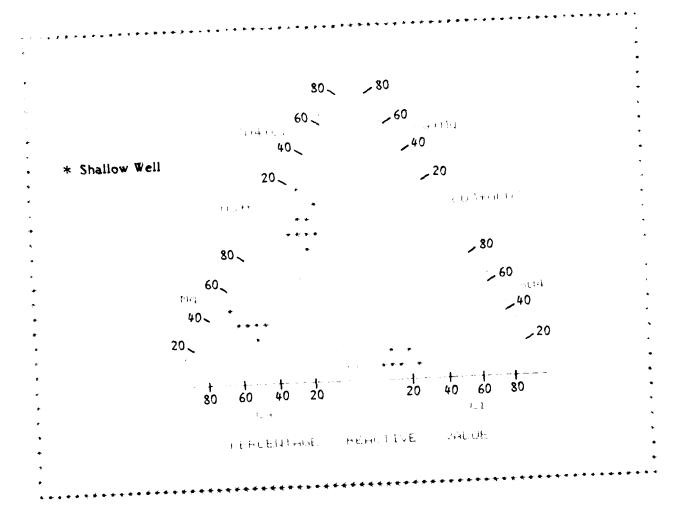


FIGURE IV-13. Groundwater anion/cation balance, Base Production Wells

7-375

6. Analytical Summary

AV confirmed the presence of volatile organic groundwater contamination at all three sites investigated in this effort. The contamination is summarized by area below.

o ACW

- Trichloroethene (TCE) was found in four shallow wells downgradient from the site.
- Benzene and related compounds were found in two deep wells downgradient from the site (however, these results were not repeatable).

o West Ditch

- TCE and Perchloroethylene (PCE) were found in one deep well and one shallow well downgradient from the site. (Perchloroethylene is also known as tetrachloroethene.)

o 7100 Area

- TCE, PCE, vinyl chloride, benzene and other benzenerelated compounds were found in 5 shallow wells downgradient from the site.
- Benzene was found in one shallow well at the jet test cell, downgradient from the site (this result was not repeatable).

o Base production wells

- 1,2-dichloroethane was found in Housing Well No. 1. (However, this result was not confirmed in a split sample collected by the base BEE, and is suspect.)

Background samples were collected at each site and along the northeast perimeter of the base. All of these background samples were free of contaminants.

During this effort, we were able to better define the vertical and lateral extent of contamination and the concentrations near the suspected source and downgradient from the site. At the AC&W area, TCE was found at concentrations up to 790 µg/L in shallow wells near the suspected source, and it was also found at 5.7 µg/L in shallow well MAFB-52 about 0.5 miles downgradient. TCE was not found in any deep wells or in any drinking water wells (which are screened even lower than the deep monitoring wells). At the 7100 Area landfill, contamination was found in shallow wells at the edge of the landfill and off base at the gravel pits (west of the site). No contamination was found in deep wells. Further migration beyond the gravel pit was not investigated. Contamination was found in one shallow well (MAFB-47) and one deep well (MAFB-63) along the West Ditch, but no off-site wells were tested to determine downgradient movement. However, sampling conducted by the Central Valley RWQCB detected contamination similar to MAFB-47 in four residential wells along Happy Lane. These wells are located approximately one-half mile west/southwest of MAFB-47.

The California Department of Health Services (DOHS, 1986) has established the action levels for many volatile organic compounds on the Methods 601/602 analysis list, including those identified in the Mather AFB samples (see Table IV-1). We compared the groundwater sampling results to the current DOHS action levels.

There are no DOHS action levels for inorganic parameters, minerals and metals. To evaluate these results, we used the federal drinking water standards for comparison (EPA, 1976; DOHS, 1978 and 1984). Table IV-4 shows the standards for the inorganic parameters tested for at Mather AFB. No standards exist for several inorganic parameters, but none of the samples showed elevated levels of any element or compound that does not have a standard.

B. Significance of Findings

1. Possible Contamination Pathways

A number of geologic factors affect the migration of contaminants from the surface or shallow subsurface into the water table. The most significant is that the base has relatively low topographical relief, so potential runoff rates are low. While most of the upper soils are relatively permeable, there is a well-defined hardpan zone under many areas of the base that will inhibit downward migration. In those areas, where the hardpan layer has been breached (by landfill trenches, etc.) or does not exist, infiltration to the underlying strata may occur.

Surrounding Mather AFB to the north, northwest, and west is an area covered by gold mining dredge tailings. This operation consisted of mining by dredging the upper 20 to 30 feet of sediment and redepositing the gravel and cobbles as mining tailings. Due to the dredging, any hardpan layer that may have been present was destroyed and the permeability of the dredge tailings is high.

One of the most significant geologic features affecting potential contaminant migration in a horizontal direction is the old buried stream channels of the American River (South Fork Gravel Formation). These deposits, which are referred to as superjacent stream channel deposits, are generally quite permeable (approximately 30 ft/day), as much as an order of magnitude higher than the surrounding sediments. Furthermore, the channel deposits are oriented in a northeast-southwest direction parallel to the regional flow of groundwater at Mather AFB.

This major set of stream channel deposits is only one of many such sets deposited as paleochannels of the American River meandered across the valley floor. As the stream continued to deposit fine-grained material on the flood plain and carried coarse materials as stream bed load, a series of high permeable zones (buried stream channels) and low permeable zones (flood plains) built up on top of one another. In some areas, a buried stream channel may be isolated both above and below by the occurrence of fine-grained materials from preceding and anteceding flood plains. Thus, a contaminant reaching the uppermost buried

stream channel would have to take a tortuous path before reaching the next set of channels. In many areas, however, each succeeding stream channel is overlain and hydraulically connected to the next stream channel due to its high permeability, thus greatly increasing the rate of vertical movement. The South Fork and Arroyo Seco Gravels, which underlie many areas of the base, were deposited in this manner. Thus, they do little to retard fluid flow from the surface down to the top of the Laguna Formation or to perched water where it exists. The water table aquifer on base is found in either the Laguna Formation or in the underlying Mehrten Formation. Water percolates slowly through the Laguna Formation, which has much more clay and silt than the overlying gravels. Contaminants travelling slowly through the Laguna Formation would be likely to sorb onto clay or silt particles, which would inhibit passage into the groundwater.

Due to its depth, it is unlikely that the Mehrten Formation would be contaminated from the surface without some direct link such as an ungrouted well bore or extremely high contamination in the overlying aquifer. There is a small head gradient (2-4 ft) between the water table and the uppermost confined aquifer, and the aquifers are separated by 75 to 100 ft of clay and silty sand. There is not enough of a pressure gradient between the aquifers to drive potentially contaminated water from one aquifer to the other.

The production zone for most wells on base begins at approximately 200 to 250 feet below the ground surface. The strata above the production zone generally consist of alternating layers of sand, gravel, silt and clay of varying permeability. The rate of percolation to the production zone is relatively higher in those areas where the overlying beds are predominantly gravel or sand and silt, rather than clay.

In the vicinity of production wells, the drawdown caused by a pumped well results in the highest head differential between the upper strata (possible source of contamination) and the production zone. Therefore, the driving force for contaminant movement between the upper strata and the production zone is highest in the vicinity of the production wells. A number of pathways for contamination in the upper strata to enter the production zone are possible. The first is infiltration and leakage through the confining layer. This is especially critical where the overlying strata are permeable due to gravel near the surface.

One well (Jet Test Cell) is screened from 39-200 feet. This upper or first permeable zone would be the first stratum to be contaminated, and wells that tap these shallower zones in areas where contamination exists are likely to become contaminated.

A second contamination pathway is the vertical movement of pollutants from a contaminated shallow aquifer down the annular space of a well into the lower aquifers. This is a common source of pollution in old wells due to past well construction practices in which no seal or an inadequate seal was provided between surface zones and deeper zones from which water is drawn into the well. This situation can cause problems in two ways. If the well is active, the contaminants will be drawn down through the well's gravel pack and be pumped up into the water supply. If the well is abandoned or not currently pumping, contaminants can flow down the gravel pack and begin to disperse into the aquifer. This contaminated aquifer water may then be pumped into water supplies from the source well or from another deep well downgradient. A third way for contaminants to spread to lower aquifers is through inactive wells that are screened in two or more aquifers. In this scenario, water enters the upper screen, flows down the inside of the well and exits a deeper screen into the aquifer. This assumes that the upper aquifer has a higher piezometric head, which is the case at this base.

2. Site-Specific Descriptions

Northeast Perimeter

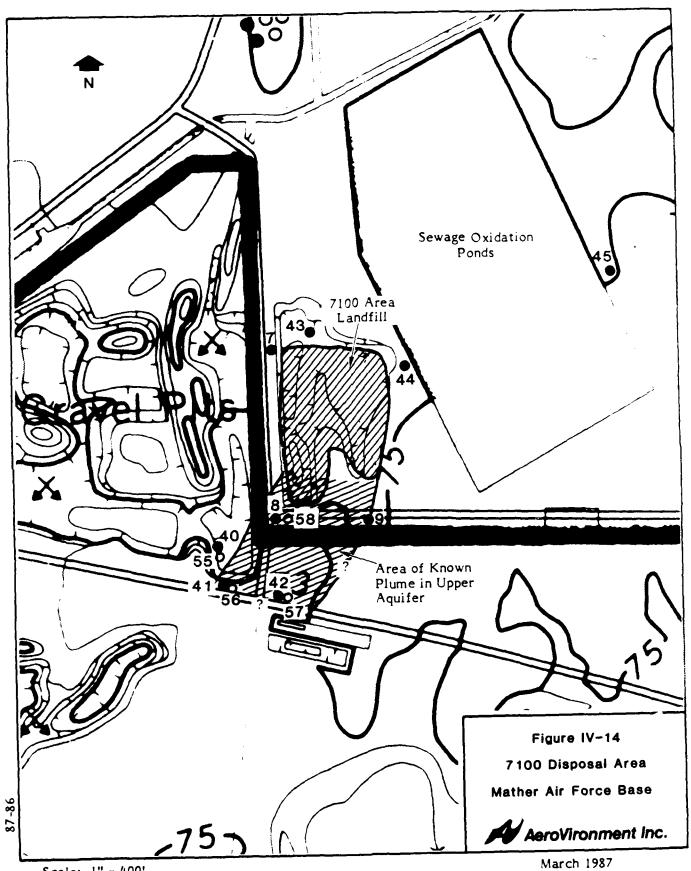
Six wells were installed along the Northeast Perimeter, three screened in the water table aquifer, and three in the uppermost confined aquifer (Mehrten Formation). One of the shallow wells (MAFB 75) was installed to replace MAFB-5 from the Phase II, Stage 1 effort, which was improperly designed and screened entirely in a clay zone. These upgradient wells were intended to determine the quality of water entering the base. None of these wells showed any significantly elevated levels of potential contaminants above naturally-occurring background levels. Water entering the base does not appear to have been degraded at this time, but the potential for off-site contamination remains, due to the geologic setting.

o Site 7 -- 7100 Disposal Area

Seven shallow (Laguna Formation) and five deep (Mehrten Formation) monitor wells were installed at the 7100 disposal area under Phase II, Stage 3 (see Figure IV-14). In addition, three existing shallow wells installed under the Phase II, Stage 1 program -- MAFB-07, 08 and 09 -- were sampled as part of this investigation. All groundwater samples were analyzed for VOC (EPA 601/8020), alkalinity, anions, TDS, minerals, metals, and total cyanide. Samples from MAFB-43, a shallow well located between the Fire Protection Training Area (FPTA) and the landfill were also analyzed for total petroleum hydrocarbons (EPA 418.1) and total phenolics (EPA 420.1).

VOCs were detected in several shallow wells. Monitor wells MAFB-8, 9, 41 and 42, located downgradient of the inactive landfill, all had repeatable levels of TCE near or exceeding the California action level (AL) for at least one round, ranging from 3.8 µg/L for MAFB-9 to 22 µg/L for MAFB-41. Vinyl chloride, a common component of landfill leachate and the potential degradation product of two-carbon halogenated solvents, was detected exceeding the California action level in MAFB-8 and 41, ranging from 2.1 to 9.9 µg/L. Other significant compounds detected in the shallow 7100 area wells located downgradient of the landfill, include PCE below the action level in MAFB-8, 41 and 42; benzene above the action level for at least one round in MAFB-8 and 40; and 1,4-dichlorobenzene with 1,2-dichloroethane above the action level in MAFB-41.

The apparent source of the shallow VOC plume is the old 7100 landfill, which was used to dispose of solvent and POL wastes from 1953 to 1966. The upgradient shallow well, MAFB-44, showed no detectable concentrations of VOCs. However, MAFB-44 is screened in what appears to be perched water zone caused by the oxidation ponds, and may not be truly representative of upgradient conditions in the water table aquifer. MAFB-7, located on the northwestern edge of the landfill, and MAFB-40, located directly downgradient of MAFB-7 in the off-base borrow pit, were both free of significant levels of VOCs (benzene at 1.1 µg/L in MAFB-40 but not repeatable), indicating little lateral spread of the shallow VOC plume. Of the four contaminated downgradient shallow wells (MAFB-8, 9, 41, and 42), the two wells that are furthest from the landfill contain higher levels of TCE,



Scale: 1" = 400' Shallow groundwater monitoring wells
 Deep groundwater monitoring wells

which suggests that contribution to the plume by the source may have diminished and a higher concentration is moving downgradient. TCE concentrations in MAFB-8, tested in May and June, 1985 under Stage 1, were an order of magnitude higher than the levels found in the same well during this investigation, a year and a half later. A possible explanation for this variance is that the perched water zone is providing increased transport of landfill leachate components during periods when the oxidation ponds are filled. Since the ponds are reportedly used to store excess runoff several times a year, "pulses" of contaminants may be possible.

The shallow water table VOC contamination does not appear to have migrated to the first confined (Mehrten Formation) aquifer. Three of the four deep wells contained no detectable VOCs. Samples from MAFB-58, located near MAFB-8, were found to contain low, repeatable levels of toluene (5.7/1.7 μ g/L), well below the action level. Since toluene was not found repeatably in the shallow downgradient wells, its presence in the confined aquifer is unexpected and may possibly be attributed to field or laboratory-induced error. Thus we do not consider the low levels involved significant.

The inorganics data for the shallow monitor wells show elevated levels of several inorganic parameters in the water table aquifer at the 7100 area. All shallow wells downgradient of the landfill had elevated total dissolved solids, up to 890 mg/L for MAFB-7 and 42, which may be indicative of a leachate plume. Correspondingly elevated levels of magnesium, sulfate, iron and manganese were also found in several shallow wells. Iron concentrations exceeded the federal secondary drinking water standard in MAFB-7, 9, and 44, and both iron and manganese exceeded the standard for at least one sampling round in MAFB-8, 42, and 45.

The dissolved iron does not appear to be contributed by the landfill, as elevated concentrations (3.7/11 mg/L) were found in the upgradient well MAFB-44. The elevated iron may be attributable to an area of perched water surrounding the inactive wastewater treatment oxidation ponds.

None of the deep wells were found to have elevated levels of inorganic parameters. Total cyanide was detected near the limit of quantitation

(LOQ) and exceeding the federal primary drinking water standard, in the first round samples from MAFB-56 and 57, but was not detected in the second round samples. Thus we suspect that it is an artifact.

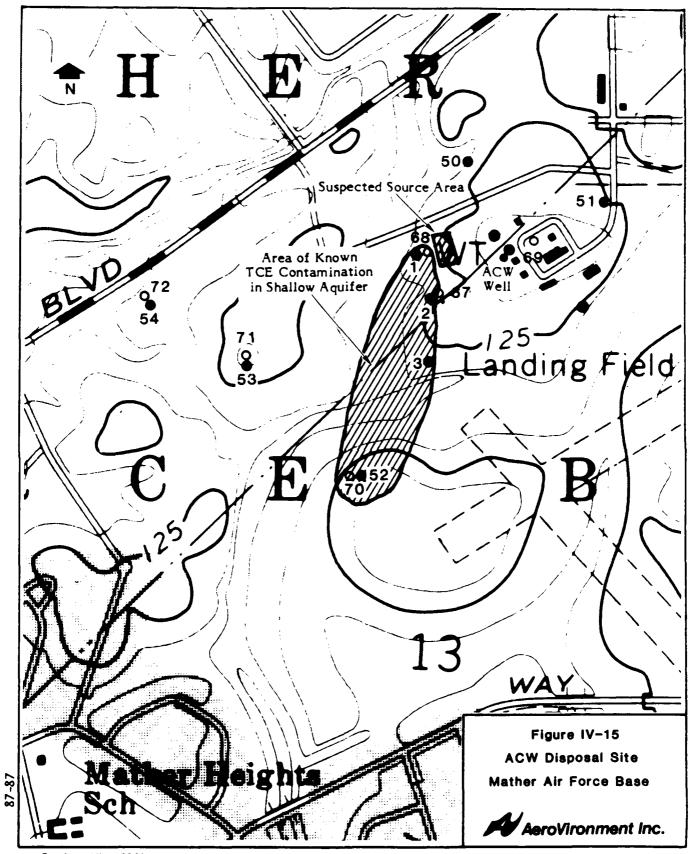
Shallow well MAFB-43, located between the Fire Protection Area (FPTA) and the landfill to measure potential contamination from the FPTA, did not contain significant concentrations of total petroleum hydrocarbons or total phenolics. Phenolics were detected in the first round sample at 24 µg/L but not during second round. A first round field blank sample was also reported to have 30 µg/L phenolics, indicating field- or laboratory-induced sample contamination.

A shallow and deep well pair, MAFB-46 and 59, respectively, installed at the Jet Test Cell downgradient of the production well, showed no significant evidence of contamination. Toluene was detected at $2 \mu g/L$ in deep well MAFB-59 for the first sampling round, but was not confirmed in the second round. Benzene was detected in shallow well MAFB-46 at 0.9 $\mu g/L$, which is above the California state action level of 0.7 $\mu g/L$, but again was for the first round only.

In summary, we have been able to determine that the organic plume extending from the 7100 Area landfill trends toward the south-southwest and does not follow the regional groundwater flow pattern. The site-specific flow direction probably shows the effects of the sewage oxidation ponds. We know that the water table aquifer has been degraded past the base boundaries, but we do not yet know the lateral extent of this degradation. The confined aquifer beneath the site appears to be unaffected by the 7100 landfill.

o Site 12 -- ACW Disposal Area

Eleven monitor wells, five shallow (Laguna Formation) and six deep (Mehrten Formation) were installed to monitor the groundwater underlying the ACW area (see Figure IV-15). Three existing shallow wells installed during the Phase II, Stage 1 program (Wells MAFB 1, 2 and 3) were also sampled as part of this investigation. All groundwater samples were analyzed for VOC (EPA 601/8020), alkalinity, anions, total dissolved solids (TDS), and minerals. The two upgradient



Scale: 1" = 500'

Shallow groundwater monitoring wells

O Deep groundwater monitoring wells

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wells, one shallow (MAFB-51) and one deep (MAFB-69), did not contain elevated levels of contaminants. Of the remaining 12 wells sampled, all three Phase II, Stage I wells, MAFB 01, 02, 03, and MAFB-52 contained levels of TCE above the California action level (AL) of 5 µg/L for at least one of the two sampling rounds. MAFB-1 was the most contaminated well, with 770/790 ug/L TCE (first round/second round result). MAFB-52, located approximately 1500 feet downgradient of MAFB-1, had TCE levels of 4.1/5.7 µg/L, a much lower concentration than at the head of the plume, but still exceeding the California action level. Well MAFB-2 was installed by another contractor during the Phase II Stage I effort. We found that it had not been developed as well as we would have liked, and all of the drilling mud was not cleaned out of the hole. We believe that the water that can be collected from the well is representative of the aquifer, but the well cannot deliver the amount of water necessary to purge three to five volumes before sampling. In this case, it is necessary to pump the well dry and assume that any water that comes into the well after that is formation water. No detectable levels of TCE were found in shallow wells MAFB-53 and 54, located northwest of MAFB-52 in a line perpendicular to the expected shallow plume path. This indicates that the plume's direction is more to the west than we had projected from the water table aquifer gradient. Although MAFB-53 was found to be free of TCE, it is screened in a different gravel zone (unconfined) than the other shallow wells because the upper gravel zone, which is saturated in MAFB-52 and 54, was dry. MAFB-50, a shallow well located north of MAFB-1 to delineate the lateral spread of the shallow TCE plume, was also free of TCE. Figure IV-16 delineates the extent of TCE contamination of the shallow aguifer as determined in this study.

None of the deep wells at the ACW were found to contain detectable TCE, which indicates that TCE contamination of the first (Mehrten Formation) confined aquifer through mixing with the water table aquifer has not occurred. However, samples from three deep wells, MAFB-68, 70, and 71, contained levels of aromatic hydrocarbons. Benzene was detected in MAFB-70 at 22 µg/L in the second round sample, along with lower concentrations of 1,4-dichlorobenzene, ethylbenzene, toluene and xylenes. These concentrations are considered significant because they exceed the California action levels for benzene

and 1,4-dichlorobenzene, but are not repeatable, and are therefore suspect. Elevated levels of alkylated benzenes were found in the first and second round samples from MAFB-68 and 71, although no California action levels were exceeded.

The aromatic compounds detected in the deep wells at the ACW are common components of jet and other fuels. Since their presence in the confined aquifer is unexpected and the source unknown, and since they occurred at low levels and were not repeated, we suspect that these compounds are the result of field- or laboratory-induced contamination. Additional sampling of these wells is necessary to draw conclusions concerning the origin of the aromatic compounds.

The anion, mineral, alkalinity and total dissolved solid results for all the ACW wells were within background levels.

o Site 15 -- West Ditch Area

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The West Ditch area includes all areas along the western boundary of the base. Two shallow and four deep wells were placed along the West Drainage Ditch to augment the two existing shallow wells from an earlier study (see Figure IV-16). In addition, a single shallow well (MAFB-49) was installed in the northwest corner of the base behind the commissary to determine upgradient conditions in the water table aquifer. Significantly elevated levels of VOCs were found in one shallow well, MAFB-47, and one deep well, MAFB-63. TCE was detected in the first round sample from MAFB-47 at 7.6 µg/L, and the second round sample showed an increase in TCE concentration to 36 µg/L and 64 µg/L for paired field duplicate results. PCE was also found in MAFB-47 at 2.5 µg/L (first round) and 7.7/18 µg/L (second round duplicate). We suspect that the source of this contamination is an oil skimmer located approximately 100 feet upgradient of MAFB-47, which has reportedly received waste oils and solvents (including TCE) through the West Ditch since its installation in 1967. The variance in TCE and PCE levels between sampling rounds may be caused by fluctuations in the level of standing water in the ditch affecting the percolation of water to the water table aquifer or may be attributable to sampling or analytical error. Deep well MAFB-60, which is located next to MAFB-47, was free of VOC contamination,

indicating no cross-contamination of the first confined aquifer. Trilinear plots of anion and cation data also show that the two aquifers have distinctly different water chemistries, and therefore are probably separate.

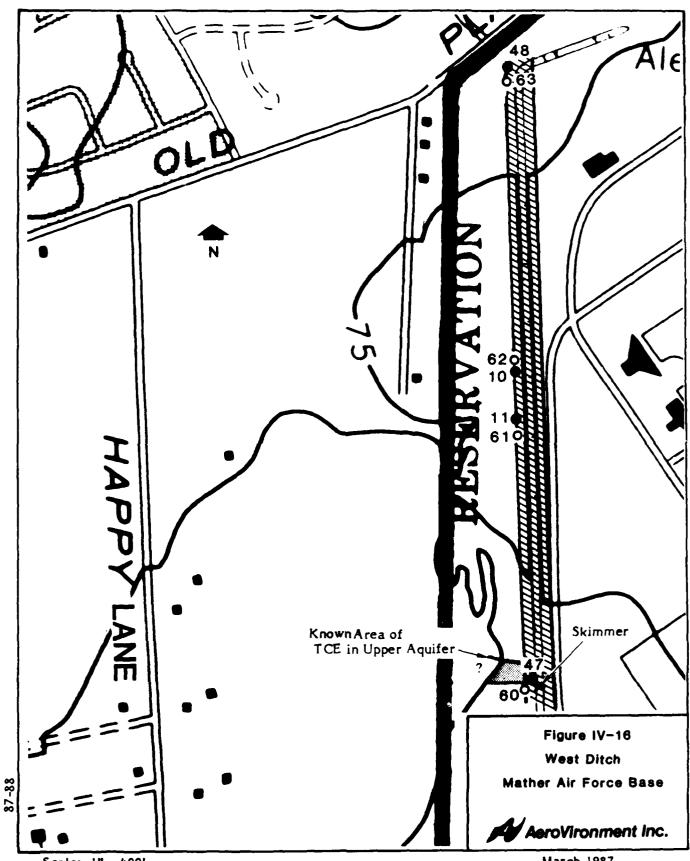
PCE, at 12/11 μg/L, was the major contaminant detected in deep well MAFB-63, located at the northern edge of the West Ditch. TCE was the only other repeatable VOC found and was detected at 6.3/1.8 μg/L. Benzene was also detected in the second round sample at 0.9 μg/L, which is above the AL of 0.7 μg/L, but was not found in the first round sample. Since the corresponding shallow well, MAFB-48, showed no contamination, the source of the PCE and TCE contamination of the underlying first confined (Mehrten Fm.) aquifer does not appear to be the drainage ditch. The groundwater gradient is approximately parallel to the northwest base boundary (Placerville Road), which suggests that the source may be off base. An on-base source could be located either close to the Placerville Road boundary upgradient from MAFB-63 or in the northern Main Base Area.

Since all of the wells at this site are situated in a line parallel to the West Ditch, we have been unable to determine the lateral extent of contamination. Figure IV-16 shows the limited areas of groundwater degradation that have been determined up to this date.

o Base Production Wells

Ten base production wells were sampled for VOCs (601/8020), anions, minerals, alkalinity and TDS. Two of these, the K-9 well and the Jet Test Cell well, contained trihalomethanes (THMs). Bromodichloromethane, dibromochloroethane, bromoform and chloroform, at 0.7 μ g/L to 2.0 μ g/L, were well below the federal primary drinking water standard maximum contaminant level (MCL) of 100 μ g/L for total THMs. These compounds are common byproducts of drinking water disinfection. The inactive ACW production well had a TCE concentration of 1.8 μ g/L, which is significantly lower than the 67 μ g/L level reported as part of the Phase II, Stage 1 investigation (Weston, 1985).

An unexpected result was the presence of 1,2-dichoroethane in Family Housing Well 1, which was detected at a concentration of 2.8 μ g/L and exceeds the California action level (AL) of 1.0 μ g/L. This level is significant,



Scale: 1" = 400'

Shallow groundwater monitoring wells
 Deep groundwater monitoring wells
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based upon the AL, although this compound was found in only one other well, shallow well MAFB-41, which is located about one mile downgradient at the 7100 disposal area. However, split samples collected by the Mather Bioenvironmental Engineer at the same time the AV samples were collected showed no detectable 1,2-dichloroethane in Family Housing Well I. Therefore, this finding is inconclusive and is not considered valid. Based on previous sampling and analysis records for the Mather base production wells from 1983 through 1986, 1,2-dichloroethane has never before been detected in Family Housing Well I. However, in March of 1985 this compound was detected in four of the other base production wells (MB-3, MB-4, HW-3, and K-9) with concentrations of up to 3.7 µg/L.

V. ALTERNATIVE MEASURES

Three potential hazardous waste sites were investigated during the Phase II, Stage 3 IRP study at Mather AFB. In addition, the Northeast Perimeter was studied to determine the quality of groundwater entering the base from upgradient locations. All three sites have been investigated previously and groundwater contamination had been identified downgradient from each site. For the most part, shallow soil contamination is not a problem at any of the sites. The results of this study verify the previous results at each of the sites.

Since the basic problem is the same for all sites, the available options for each site will also be the same. This chapter presents the options that may be appropriate for each site (plus the Northeast Perimeter) as part of the IRP Phase II. Groundwater contamination is the primary concern at each site. Shallow soil contamination is not considered to be significant at any of the sites. In the first part of the chapter (V.A), the four basic options are discussed. In the second part of the chapter (V.B), we have listed those options which apply to each of the sites studied in Phase II, Stage 3. Specific site recommendations will be presented in Chapter VI.

A. Description of Options

1. Option I - No Action

No further action need be taken if it has been determined that: a) there is no evidence of soil or groundwater contamination or, b) the amount of contamination found is within acceptable limits and poses no serious threat to the environment. Wells would be maintained only for water level information.

2. Option 2 - Continued Monitoring of Existing Wells

Existing wells may continue to be monitored if: 1) a low-level plume is present and the continued monitoring would be used to establish a periodic sampling program as a safety measure; 2) a plume is not now present, but changing

conditions may cause a plume to form; 3) the site is upgradient from municipal or domestic supply wells and the wells could be used as an early warning system to protect water quality. Wells would be sampled and analyzed periodically for specific compounds. Water levels would also be monitored.

Aquifer testing will provide some values of the transmissivity of the aquifers being investigated. The distribution of current monitoring wells is not ideal for aquifer testing at all of the sites. However, the resulting data may provide an indication of groundwater and contaminant migration rates.

3. Option 3 - Install More Wells

More groundwater monitoring wells might be installed if additional wells are required upgradient or downgradient of a site. These wells would be used to verify the quality of water entering the site, or to determine the horizontal or vertical orientation of a plume being generated by a site. Shallow wells would be suggested to determine horizontal migration of known upper aquifer contamination. Deep wells would be used to check for vertical movement into the lower aquifers.

A few sites are upgradient from base supply wells. The lower formations that yield water to the supply wells should probably be monitored. Any deep monitoring wells recommended near production wells would need to be screened in the same zone as the uppermost screened area of the supply well.

4. Option 4 - Corrective Action, Move to Phase IV

If groundwater contamination is proven to be coming from a site, and it poses a serious and immediate threat to the environment, corrective action should be taken. Corrective action (Phase IV) is initiated once the type, magnitude and extent of the contamination and aquifer properties at a particular site have been determined. This could involve extraction, treatment and reinjection of contaminated water; in-situ remediation; supplying alternative water sources; or other available technology developed in an IRP Phase III research study.

Soil excavation is not considered appropriate as part of Phase II for any of the sites at Mather AFB, because the waste sites are generally large and old, so that potential contamination has been widely dispersed from its original source area.

Chapter VI presents AeroVironment's specific recommendations for each site investigated during the Phase II, Stage 3 effort. All of the sites fall into one of the basic categories presented above. In addition to the specific action (if any) recommended, we will present the reasoning for, and objective of, the proposed action.

B. Site-Specific Options

A summary of the site-specific alternative measures is shown in Table V-1.

1. Northeast Perimeter

Option 1 -- No Action

This option would be appropriate for this site because no contamination was found during this study.

Option 2 -- Continued Monitoring of Existing Wells

This option would be appropriate to continue monitoring the upgradient conditions at the base. No contaminants have been found to date.

Option 3 -- Install More Wells

This option would be appropriate if some of the groundwater contamination identified at IRP sites was the result of off-base, upgradient sources. However, current information indicates that upgradient sources are probably not responsible for problems at Mather AFB.

TABLE V-1. Summary of Alternative Measures

		is s	Sites	
Option	Northeast Perimeter	7100 Disposal Area	ACW Disposal Site	West Ditch
I, No action	Appropriate	Not appropriate because of contamination found	Not appropriate because of contamination found	Not appropriate because of contamination found
2, Continued Monitoring	Appropriate to check for changing conditions	Appropriate to check for changing conditions	Appropriate to check for changing conditions	Appropriate to check for changing conditions
3, Install More Wells	Not necessary, no contamination	Appropriate to further define lateral spread of contarnination	Appropriate to further define lateral spread of contamination	Appropriate to further define upgradient and downgradient conditions
4, Corrective Action	Not necessary, no contamination	May ultimately be needed, but plume not yet fully defined	May ultimately be needed, but plume not yet fully defined	May ultimately be needed, but plume not yet fully defined

Option 4 -- Corrective Action, Move to Phase IV

This option is not justified because no contamination was found in upgradient wells.

2. Site 7 -- 7100 Disposal Area

Option 1 -- No Action

This option is not appropriate because TCE, vinyl chloride and other chemical contamination has been identified in wells downgradient from this site.

Option 2 -- Continued Monitoring of Existing Wells

This option is appropriate for this site because of the contamination identified in groundwater monitoring wells.

Option 3 -- Install More Wells

This option is appropriate because of the contamination found in groundwater downgradient from this site. Additional wells are justified to further define the spread of contamination from this site, particularly off base. Existing wells would continue to be monitored. (See Chapter VI for recommended well design and placement.)

Option 4 -- Corrective Action, Move to Phase IV

Although this option will ultimately be appropriate for this site, it is premature to move to Phase IV at this time. The full magnitude of the contamination at this site has not been fully defined.

3. Site 12 -- ACW Disposal Site

Option I -- No Action

This option is not appropriate because TCE contamination has been identified in wells downgradient from this site.

Option 2 -- Continued Monitoring of Existing Wells

This option is appropriate for this site because of the contamination identified in groundwater monitoring wells.

Option 3 -- Install More Wells

This option is appropriate because of the contamination found in groundwater downgradient from this site. Additional wells are justified to further define the spread of contamination from this site, particularly off base. Existing wells would continue to be monitored. (See Chapter VI for recommended well design and placement.)

This site is upgradient from base supply wells. The formations that yield water to the supply wells should probably be monitored. Any monitoring wells recommended near production wells would need to be screened in the same zone as the uppermost screened area of the supply well(s).

Option 4 -- Corrective Action, Move to Phase IV

Although this option will ultimately be appropriate for this site, it is premature to move to Phase IV at this time. The full magnitude of the contamination at this site has not been fully defined.

4. Site 15 -- West Ditch

Option 1 -- No Action

This option is not appropriate at this site because TCE and PCE

contamination have been identified in groundwater monitoring wells downgradient from this site.

Option 2 -- Continued Monitoring of Existing Wells

This option is appropriate for this site because of the contamination identified in groundwater wells.

Option 3 -- Install More Wells

This option is appropriate because of the contamination found in the groundwater downgradient from the site. Additional wells are justified to further define the spread of contamination from this site, particularly off base. Existing wells would continue to be monitored. (See Chapter VI for recommended well design and placement.)

Option 4 -- Corrective Action, Move to Phase IV

Although this option will be appropriate for this site, it is premature to move to Phase IV at this time. The full magnitude of the contamination at this site has not yet been fully defined. Contamination has been identified only near the suspected source (no monitoring has occurred off base).

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VI. RECOMMENDATIONS

This chapter outlines AV's recommendations for further work related to the IRP program at Mather AFB. As the Air Force requested, we have assigned each site to one of the categories defined below.

Category I: Sites where no further action (including remedial action) is required.

Category II: Sites requiring additional monitoring or work to quantify or further assess the extent of current or future contamination.

Category III: Sites that will require remedial action (i.e., that are ready for IRP Phase IV action).

The three sites investigated during the Stage 3 effort are all considered to be Category II sites. Each has been found to be a source of groundwater contamination; however, the full extent of the contaminant plume has not been defined. The Northeast Perimeter was also studied as part of this project. Although it is not a discrete site, we have prepared recommendations for it as if it were. Table VI-1 summarizes our recommendations.

One general recommendation is to consolidate the IRP efforts in order to look at all of the sites and all of the monitoring wells together. There would be great advantage in sampling all wells during the same intervals (and at the same time), so that contamination problems could be evaluated in a comprehensive context.

Northeast Perimeter -- Category II

All six wells along the Northeast Perimeter of Mather AFB were found to be free of contamination. Sampling in 1985 also showed no contamination. These results indicate that the water entering base along the Northeast Perimeter from

TABLE VI-1. Summary of recommendations.

Site	Recommendation
Northeast Perimeter (Category II)	 Continue monitoring upgradient conditions by sampling the 6 existing wells semiannually and test for VOAs (Method 601).
	 Abandon monitoring Well MAFB-5, in accordance with state and local requirements.
No. 7, 7100 Disposal Area (Category II)	 Install 3 additional groundwater monitoring wells, each in the water table aquifer and each downgradient from the existing wells (the new wells would be off base).
	- Sample the 15 existing wells plus the 3 new ones semiannually and test for VOAs (Methods 601 and 602), metals and minerals (Method 200).
No. 12, ACW Disposal Site (Category II)	 Install 3 additional groundwater monitoring wells, each in the water table aquifer and each downgradient from the existing wells.
	 Sample the 14 existing wells plus the 3 new ones semiannually and test for VOAs (Method 601). In addition, test samples from deep wells for Method 602 compounds at least once more.
No. 15, West Ditch (Category II)	 Install 4 additional groundwater monitoring wells, each in the water table aquifer. One well would be located upgradient of the west ditch skimmer and 3 would be downgradient, west of Happy Lane.
	- Sample the 9 existing wells plus the four new ones semiannually and test for VOAs (Method 601/602).
	 Install one additional deep well which has been previously proposed as a recommendation of Phase II, Stage 2.
	 Research all private wells within 1.0 mile of the site, and sample as necessary.

the two aquifers of concern (the water table and first confined water) is not contributing to groundwater contamination problems identified at Stage 3 sites on base. Based upon the depths currently monitored no additional wells are necessary as part of the monitoring for ACW or 7100. Additional wells are necessary to monitor conditions at Stage 2 sites, but these have previously been recommended as part of the Stage 2 report. No corrective action is needed. However, monitoring should be continued to verify the upgradient conditions remain unchanged and to help in evaluating problems at downgradient sites on base. The six existing wells (MAFB-64, 65, 66, 73, 75 and 76) should be sampled semiannually as part of a sampling program for all existing Category II sites. The samples should be tested for volatile organics using EPA Methods 601 and 602. In addition, water levels at MAFB-4 and 6 should be measured on a semiannual basis.

Since we consider MAFB-5 (from Phase II, Stage 1) to be of no monitoring value because the screened interval is located in a clay zone, we recommend that it be sealed in accordance with state and county guidelines by grouting the well from bottom to top.

Site 7 -- 7100 Disposal Area - Category II

Seven shallow monitoring wells and five deep monitoring wells were installed and sampled as part of the Stage 3 effort. In addition, three existing shallow monitoring wells were sampled. Five of six downgradient shallow wells were found to be contaminated with one or more of the following compounds: TCE, PCE, vinyl chloride, DCA and 1,4-Dichlorobenzene. TCE was also identified in wells sampled in 1985 from Stage 1. TCE was found to be higher in wells located off the base than in wells located at the edge of the site. An increase in concentration was observed in wells to the south and southwest. Upgradient shallow wells are uncontaminated. Although the shallow monitoring well at the Jet Test Cell showed a level of benzene above the DOHS action level, it was not repeatable and we suspect it to be lab or sampler error. According to the analytical data, the deep wells are free of contamination.

TCE in the shallow aquifer has been identified off base. The leading edge of the plume has not been identified, but it appears to extend beyond the off-base gravel pit immediately southwest of the site. From samples collected to date, the plume appears to be moving to the south, southwest and, to a lesser degree, the west. Three additional shallow monitoring wells should be installed into the water table aquifer to identify the downgradient extent of the contamination. One well should be located 1/4 to 1/2 mile south of MAFB-42 to determine the southern and eastern extent of plume migration. The other two wells should be located 1/4 to 1/2 mile downgradient from MAFB-40 and 41. These three wells, in combination with MAFB-59, would form an arc from south to west, about 1/2 mile from the site, and would be used to monitor the extent of contamination. The exact locations of these wells should not be determined until aquifer tests are run on the existing shallow wells to determine site-specific conditions. No known domestic or irrigation wells are available for additional monitoring in this area.

The 15 existing wells and three new wells should be sampled semiannually and the water tested for volatile organics by EPA Methods 601 and 602 and for metals and minerals by EPA Method 200.7. If further testing of the deep wells shows no contaminants (particularly MAFB-46 where benzene was identified but not repeated), sampling from deep wells should be reduced to once a year.

Site 12 -- ACW Disposal Site - Category II

Five shallow monitoring wells and six deep monitoring wells were installed and sampled as part of the Stage 3 effort. In addition, three existing shallow monitoring wells were sampled. Four of the six downgradient shallow wells were found to be contaminated with TCE. Contamination in the three wells near the suspected source ranged from 790 μ g/L to 25 μ g/L. These values are slightly higher than those reported from Stage 1 sampling in 1985. One well located about 1/4 mile further downgradient contained about 5 μ g/L, a substantial reduction. All upgradient wells were free of contamination. Two deep downgradient wells were found to contain low levels of aromatic hydrocarbons, but these results were not repeatable and we suspect them to be sampling or laboratory error. Thus we believe the deep wells to be free of contamination.

The ACW site is located directly upgradient from two base production wells in the base housing area. The combination of the site's location relative to drinking water wells, plus the high levels of TCE observed near the suspected disposal pipe location are cause for further study. The leading and southern edges of the plume have not yet been identified, but it appears at this time that MAFB-52 (with only 5 µg/L) is near the leading edge. However, there is no indication as to whether the plume is extending to the south. Three additional shallow monitoring wells should be installed into the water table aquifer to identify the southern and western edge of the plume. One well should be located about 800 ft southeast of WAFB-52 to monitor conditions south of the existing set of downgradient wells (MAFB-54, 53 and 52). The other two wells should be located about halfway between MAFB-52 and the production wells closest to the site (FH-3 and FH-6). These new wells would not be located near enough to the production wells to require screening in the lower zones. In addition they should be sited only after aquifer tests are run on the existing shallow wells to determine site-specific conditions. The result would be three rows of shallow wells located between the source and the production These rows, in addition to the existing deep wells, should provide information about the three-dimensional movement of TCE from the ACW.

The 14 existing wells and three new wells should be sampled semiannually and the water tested for volatile organics by EPA Method 601. The initial set of samples should also be tested for aromatic compounds (by EPA Method 602) to determine whether the benzene and other aromatics detected in the deep wells during Stage 3 are actually present. If no aromatics are found, no further testing for those compounds is necessary. If they are found, additional study will be necessary.

Site 17 -- West Ditch - Category II

Three shallow monitoring wells and four deep monitoring wells were installed and sampled as part of the Stage 3 effort. In addition, two existing shallow monitoring wells were sampled. The shallow well near the skimmer was found to be contaminated with TCE and PCE. The deep well at the north end of the ditch was also contaminated with TCE, PCE and benzene. No TCE contamination was found during Stage 1 sampling in 1985 (no TCE was found in the Stage 1 wells,

MAFB-10 and 11, during this stage either). No upgradient or "far" downgradient wells exist at the West Ditch, so it is difficult to assess the extent of the groundwater problem; however, shallow off-base domestic wells along Happy Lane have been found to contain significant levels of TCE (Happy Lane Groundwater Investigation; CRWQCB, August, 1984).

The West Ditch site is located along the western border of Mather AFB. Private homes which use well water are located within 1/2 mile downgradient of the site. Four additional shallow monitoring wells drilled into the water table aquifer are needed to determine the extent of groundwater contamination and to verify the source of the TCE. The first well should be located upgradient from MAFB-47 to verify that the West Ditch site is the source of the TCE/PCE. The other three monitoring wells should be located downgradient, on the west side of Happy Lane. These wells would be used to determine the length and width of the plume. No additional deep wells are considered necessary at this time. However, a deep well has been proposed as part of Stage 2 recommendations and should be installed. As an upgradient well it would help to determine the source of TCE/PCE in the deep well at the north end of the west ditch. Also, an extensive research and sampling program is necessary to determine the extent of the problem in private wells along Happy Lane. Research should be conducted on the age, condition, depth and historical sampling results of all private wells within a 1 mile of the West Ditch. The result will be a better understanding of the usefulness of these private wells in investigating contamination from the West Ditch.

The nine existing wells, the four new shallow wells and any appropriate private wells should be sampled semiannually and the water tested for volatile organics by EPA Methods 601 and 602. (We assume that the upgradient deep well will also be sampled semiannually, but as part of the Stage 2 site with which it is associated.)

APPENDIX A

Definitions, Nomenclatures and Units of Measurement

A. DEFINITIONS, NOMENCLATURES AND UNITS OF MEASUREMENT

ACUREX: Laboratory selected to analyze samples collected during field investigation at Mather Air Force Base.

ACW: Air command and warning area.

AF: Air Force.

AFB: Air Force Base.

Ag: Silver.

ALLUVIUM: Materials eroded, transported and deposited by streams.

ANALYTE: The specific component measured in a chemical analysis.

ANION: A negatively charged ion.

ANOMALY: A local feature distinguishable in a geophysical measurement.

AQUICLUDE: Poorly permeable formation that impedes groundwater movement and does not yield to a well or spring.

AQUIFER: A geologic formation, group of formations, or part of a formation that is capable of yielding water to a well or spring.

AQUITARD: A geologic unit that impairs groundwater flow.

AROMATIC: Description of organic chemical compounds in which the carbon atoms are arranged in a ring associated with special electron stability. Aromatic compounds are often more reactive than nonaromatics.

ARTESIAN: Groundwater contained under hydrostatic pressure.

As: Arsenic.

AV: AeroVironment Inc.

AVGAS: Aviation Gasoline.

Ba: Barium.

BAILER. A tubular piece of equipment with a check valve at one end consisting of a simple ball and seat arrangement. It is lowered down a well via a rope and pulley system to collect well water samples.

BASEMENT: The oldest rocks in a given area, a complex of metamorphic and igneous rocks that underlies all the sedimentary formations. Usually Precambrian or Paleozoic in age.

BED: A characteristic of sedimentary rocks in which parallel planar surfaces separating different grain sizes or compositions indicate successive depositional surfaces that existed at the time of sedimentation.

BEDFORMS: Morphologic features having various systematic patterns of relief, created by the conditions of flow at the dynamic interface between cohesionless sediment and a fluid.

BEE: Bioenvironmental Engineer

BENTONITE: A clay formed from the decomposition of volcanic ash that has great ability to absorb or adsorb water and to swell accordingly. It is commonly used to seal a groundwater well in a nonscreened area.

BES: Bioenvironmental Engineering Services.

BEYLIK DRILLING, INC.: Drilling company selected to install the monitor wells at Mather Air Force Base.

BIODEGRADABLE: The characteristic of a substance to be broken down from complex to simple compounds by microorganisms.

BLS: Below land surface.

BLIND DUPLICATE: A field replicate sample submitted to a laboratory as a routine sample for analysis without any identification as a quality control sample. The purpose of blind duplicate samples is to monitor sampling and analytical precision without the introduction of laboratory bias.

BNA: Base/neutral acid fraction of priority pollutants.

Br: Bromine.

BRAIDED STREAM: A stream flowing in several dividing and reuniting sections, the cause of the division being the obstruction by sediment deposited by the stream.

Ca: Calcium.

CAPILLARY FRINGE: The zone overlying the saturated zone, which contains capillary interstices that may be filled with water.

CATION: A positively charged ion.

Cd: Cadmium.

CHAIN-OF-CUSTODY: The documentation of sample possession, beginning at collection and ending at analysis. A chain-of-custody form accompanies samples and records the data and time of each sample possession transfer.

CHRISTIE BOX: A small reinforced concrete box with a locking steel cap that is cemented to the ground. It is used to complete a well at the surface so that the top is flush to the ground.

CI: Chlorine.

CLAY: A sediment particle having a diameter less than 1/512 mm.

COBBLES: A collective term for sediments whose particle size is between 64 and 256 mm.

CONDUCTIVITY: A property of an electric conductor defined as the electrical current per unit area divided by the voltage drop per unit length.

CONDUCTOR CASING: Cylindrical well material used to seal off the upper water-bearing zone.

CONFINED AQUIFER: An aquifer bounded above and below by impermeable strata or by geologic units distinctly less permeable than the aquifer itself.

CONFINING UNIT: An aquitard or other poorly permeable layer that restricts the movement of groundwater.

CONSOLIDATION: The adjustment of a saturated soil in response to increased load. Involves the squeezing of water from the pores and a decrease in void ratio.

CONTAMINATION: The degradation of natural water quality or soil to the extent that its usefulness is impaired. This term does not imply any specific limits, since the degree of contamination that is permissible depends on the use for which the water is intended.

CONE OF DEPRESSION: The depression produced in a water table or piezometric surface by pumping or artesian flow.

Cr: Chromium.

CRETACEOUS: One of the eras of geologic time, lasting from 136 to 64 million years before the present.

Cu: Copper.

DBCP: Dibromochloropropane.

DCE: Dichloroethene.

DH: Drill hole.

DIELECTRIC CONTRAST: A contrast between conducting materials and non-conducting materials.

- DISPOSAL FACILITY: A facility or part of a facility at which hazardous waste is intentionally placed into or on land or water and at which waste will remain after closure.
- DISPOSAL OF HAZARDOUS WASTE: The discharge, deposit, injection, dumping, spilling, or placing of any hazardous waste into or on land or water so that it or any of its constituents may enter the environment or be emitted into the air or discharged into any waters, including groundwater.

DoD: Department of Defense.

DOHS: California Department of Health Services.

DOWNGRADIENT: In the direction of decreasing hydraulic static head; the direction in which groundwater flows.

DRILLING: Air rotary drilling.

DRINKING QUALITY WATER: Water meeting primary drinking water standards.

DUMP: An uncovered land disposal site where solid and/or liquid wastes are deposited with little or no regard for pollution control or aesthetics. Dumps are susceptible to open burning and are exposed to the elements, disease vectors and scavengers.

EARTH TECHNOLOGY CORPORATION: Company selected to conduct the geophysical surveys at Mather Air Force Base.

EDB: Ethylenedibromide

EFFECTIVE PRECIPITATION: The mean annual precipitation minus the mean annual evaporation.

ELECTROMAGNETIC SURVEY: A geophysical method employing electromagnetic waves at the earth's surface. When waves impinge on a conducting formation or saturated soil, they induce currents that are detected by an instrument at the surface.

E-LOG: Collective term for a number of geophysical logs run in an open borehole to help determine the lithology of the penetrated formations.

EM: Electromagnetic survey.

EOCENE: Strata of the Tertiary era, between the Paleocene and Oligocene, lasting from 60 to 40 million years before the present.

EPA: U.S. Environmental Protection Agency.

E.P. TOXICITY: Extraction procedure toxicity, one criteria for determining whether a material is a hazardous waste. The E.P. toxicity test is a leachate simulation established by EPA to determine whether toxic material will leach from the waste over time. The test method is specified in 40 CFR 261, Appendix II.

- EROSION: The wearing away of land surface by wind, water, or chemical processes.
- EXPLOSIMETER: Monitoring device for detecting explosive gases in ambient air by reading percent of lower explosive limit.

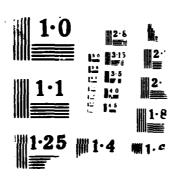
F: Fluorine.

FAA: Federal Aviation Administration.

Fe: Iron.

- FIELD BLANK: A blank sample that is kept in the sample storage area throughout the sampling activities. After activities are over, this sample is analyzed to see whether the storage environment has introduced contaminants into the samples.
- FINING-UP CYCLE: Referring to a portion of a sedimentary sequence exhibiting a vertical change in grain size from coarse- to fine-grained. Fining-up cycles as seen in outcrop, drill core or drill cuttings are characteristic of certain depositional environments depending on the vertical scale of the cyclic deposit.
- FLOOD PLAIN: The lowland and relatively flat areas adjoining inland and coastal areas of the mainland and off-shore islands, including areas subject to a one percent or greater chance of flooding in any given year.
- FLOW PATH: The direction or movement of groundwater as governed principally by the hydraulic gradient.
- FLUVIAL: Of, or pertaining to rivers; produced by river action.
- FORMATION: The basic unit for the naming of rocks in stratigraphy: a set of rocks that are or once were horizontally continuous, that share some distinctive feature of lithology, and that are large enough to be mapped.
- FPTA: Fire Protection Training Area.
- GC/MS: Gas chromatograph/mass spectrometer, a laboratory instrument for separating and identifying unknown organic compounds.
- GEOPHYSICAL SURVEY: The exploration of an area in which geophysical properties and relationships unique to the area are mapped by one or more methods.
- GPR: Ground-penetrat ng radar.
- GRAVEL: A collective term for sediments whose particle sizes are greater than 2 mm.
- GRAVEL PACK: Sand or gravel that is smooth, uniform, clean, well-rounded and siliceous. It is placed in the annulus of the well between the borehole wall and the well screen to prevent formation material from entering the screen.

3/10 UNCLASSIFIED F/G 24/4 NL.



- GROUND-PENETRATING RADAR: A method used in a geophysical survey in which radar transmissions detect the boundaries between media with different electrical and physical properties in order to locate buried objects and estimate the thickness of landfill covering layers.
- GROUNDWATER: Water in the saturated zone beneath the land surface that is under atmospheric or artesian pressure.
- GROUNDWATER RESERVOIR: The earth materials and open spaces beneath the land surface that contain groundwater.
- GROUT: A cement/sand mixture that provides a water-tight seal between the well casing and the borehole wall.
- HARDPAN: A layer of strongly cemented sediments often found a short distance below the ground surface.
- HARM: Hazard Assessment Rating Methodology.
- HALOGENATED: An organic compound containing fluorine, chlorine, bromine, iodine, or astatine.
- HAZARDOUS SUBSTANCE: Under CERCLA, the definition of hazardous substance includes:
 - 1. All substances regulated under Paragraphs 311 and 307 of the Clean Water Act (except oil)
 - 2. All substances regulated under Paragraph 3001 of the Solid Waste Disposal Act
 - All substances regulated under Paragraph 112 of the Clean Air Act
 - 4. All substances that the Administrator of EPA has acted against under Paragraph 7 of the Toxic Substance Control Act
 - 5. Additional substances designated under Paragraph 102 of the Superfund bill
- HAZARDOUS WASTE: As defined in RCRA, a solid waste, or combination of solid wastes, that, because of its quantity, concentration, or physical, chemical or infectious characteristics, may cause or significantly contribute to an increase in mortality or an increase in serious, irreversible, or incapacitating reversible illness or may pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed.

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HAZARDOUS WASTE GENERATION: The act or process of producing a hazardous waste.

HDPE: High density polyethylene.

HEAVY METALS: Metallic elements, including the transition series, which include many elements required for plant and animal nutrition in trace concentrations but become toxic at higher concentrations.

Hg: Mercury.

HOLDING TIME: The amount of time after sampling in which a sample must be analyzed or extracted, according to the EPA.

HQ ATC: Headquarters Air Training Command.

HYDROCARBONS: Organic chemical compounds composed of hydrogen and carbon atoms chemically bonded. Hydrocarbons may be straight chain, cyclic, branched chain, aromatic, or polycyclic, depending upon the arrangement of the carbon atoms. Halogenated hydrocarbons are hydrocarbons in which one or more hydrogen atoms has been replaced by a halogen atom.

I.D.: Inside diameter.

IGNEOUS: Formed by solidification from a molten or partially molten state.

INDURATED: Sediments hardened by heat, pressure or natural concentration.

INFILTRATION: The movement of water through the soil surface into the ground.

IRP: Installation Restoration Program.

JP-4: Jet Propulsion Fuel Number Four, military jet fuel.

K: Potassium.

LACUSTRINE: Produced by or pertaining to lakes.

LAGUNA FORMATION: A stratigraphic section comprised of compacted layers of silts, sands, and clays, with hardpan in surface soils derived from the erosion of the Sierra Nevada Mountains.

LEACHATE: A solution resulting from the separation or dissolving of soluble or particulate constituents from solid waste by the percolation of water.

LEACHING: The process by which soluble materials in the soil, such as nutrients, pesticide chemicals or contaminants, are washed into a lower layer of soil or dissolved and carried away by water.

LIMIT OF QUANTITATION: The lower limit of the concentration or amount of a substance that must be present before a method is considered to provide quantitative results. By convention, LOQ = 10s₀, where s₀ is the estimate of the standard deviation at the lowest level of measurement.

LINER: A continuous layer of natural or man-made materials beneath or on the sides of a surface impoundment, landfill, or landfill cell that restricts the downward or lateral escape of hazardous waste, hazardous waste constituents or leachate.

LITHOLOGY: The systematic description of rocks, in terms of mineral composition and texture.

LOAM: A soil composed of a mixture of clay, silt, sand and organic matter.

LOQ: Limit of quantitation.

MAFB: Mather Air Force Base groundwater monitoring well.

MB: Main Base water production well.

MAGNETOMETER SURVEY: A measurement of magnetic intensity in an area of earth.

MAJCOM: Major command.

MDL: Method Detection Limit.

MEANDERING STREAM: A stream that develops broad, semicircular curves by eroding the outer bank of a curve and depositing sediment against the inner bank.

MEHRTEN FORMATION: A stratigraphic section that comprises volcanic-derived angular gravels and sand, dark mafic rock fragments, and mudflows. It is discontinuous, with abundant cross-bedding and cut-and-fill structures.

MEK: Methyl ethyl ketone.

MEMBER: A lithologic entity within a formation.

MESOZOIC: One of the eras of geologic time, following the Paleozoic and succeeded by the Cenozoic era, lasting from 230 to 70 million years before the present.

METALS: See "Heavy Metals."

METAMORPHIC: Segregation of certain minerals into lenses and bands accomplished by altering rock composition, texture and internal structure through pressure, heat and the introduction of new chemical substances.

Mg: Magnesium.

MILLIEQUIVALENT: The quantity of a substance that gains or loses 1 x 10⁻³ mole of electrons.

MN: Manganese.

MOGAS: Motor gasoline.

MONITORING WELL: A well used to measure groundwater levels and to obtain samples.

MOUNDING: An increase in groundwater elevation beneath an area of recharge.

MSL: Mean sea level.

MUD ROTARY DRILLING: A drilling method for boring holes in the earth that employs water to remove cuttings from the hole.

Na: Sodium.

No; Nitrite.

NO3: Nitrate.

NONINTRUSIVE: Method of investigation in which information may be gained without disturbing the object being investigated.

OD: Outside diameter.

O2: Oxygen molecule.

OEHL: Occupational and Environmental Health Laboratory.

O&G: Oil and grease.

ORGANIC: Being, containing or relating to carbon compounds, especially in which hydrogen is attached to carbon.

OVA: Organic vapor analyzer.

OVERBANK DEPOSITS: All sediments deposited by a river onto a valley floor outside of the stream channel.

OVM: Organic vapor meter.

OXYGEN DEFICIENCY: This occurs when air contains less than 16% oxygen, at which point it is insufficient to support human life.

PALEO-CHANNEL: A stream channel that existed during some previous epoch of the earth's development.

PALEOZOIC: One of the eras of geologic time, following the Late Precambrian and succeeded by the Mesozoic era, lasting from 600 to 230 million years before the present.

Pb: Lead.

PCB: Polychlorinated biphenyl; liquids used as a dielectrics in electrical equipment.

PCE: Tetrachloroethene (Perchloroethylene).

PERCHED WATER TABLE: A water table above a relatively impermeable zone underlain by unsaturated rocks of sufficient permeability to allow groundwater movement.

PERCOLATION: Movement of moisture by gravity or hydrostatic pressure through interstices of unsaturated rock or soil.

PERMEABILITY: The capacity of a porous rock, soil or sediment to transmit a fluid without damage to the structure of the medium.

PERSISTENCE: As applied to chemicals, those that are stable and remain in the environment in their original form for an extended period of time.

PESTICIDE: An agent used to destroy pests. Pesticides include such specialty groups as herbicides, fungicides, insecticides, etc.

pH: The negative logarithm of the hydrogen ion activity that indicates the acidity or basicity of a sample.

PHENOL: Total recoverable phenolics -- any of various acidic compounds analogous to phenol and regarded as hydroxyl derivatives of aromatic hydrocarbons.

PIEZOMETRIC HEAD: The upward hydrostatic pressure created in a confined aquifer that causes water to rise above the confining layer when penetrated by a well.

PLEISTOCENE: Strata of the Tertiary Era, between the Holocene and Pliocene, lasting from 1 million to 10,000 years before the present.

PLIOCENE: Strata of the Tertiary Era, between the Pleistocene and Miocene, lasting from 10 to 1 million years before the present.

PLUME: The spreading of a contaminant in a fanning-out manner from the source.

PO: Phosphate.

POL: Petroleum, oil and lubricants.

POLLUTANT: Any introduced gas, liquid or solid that makes a resource unfit for a specific purpose.

POROSITY: The ratio, in percent, of the volume of void space to the total volume of sediment or rock.

POTENTIOMETRIC SURFACE: The imaginery surface to which water in an artesian aquifer would rise in tightly screened wells penetrating it.

PPB: Parts per billion by weight, equivalent to µg/kg, or µg/l for water.

PPM: Parts per million by weight, equivalent to ug/g, or mg/l for water.

psi: Pounds per square inch.

PRECIPITATION: Rainfall.

QA/QC: Quality assurance/quality control.

RCRA: Resource Conservation and Recovery Act.

RECEPTORS: The group or resource on which a waste contamination source might impact.

RECHARGE: The addition of water to the groundwater system by natural or artificial processes.

RECHARGE AREA: A surface area in which surface water or precipitation percolates through the unsaturated zone and eventually reaches the zone of saturation. Recharge areas may be natural or man-made.

RECORDS SEARCH: The IRP Records Search for Mather Air Force Base, compiled and written by CH2M-Hill.

RESISTIVITY: A factor of the limit to a steady electric current in a conductor that depends upon the material and its physical condition.

RFB: Request for bids.

RPD: Relative percent difference.

RELATIVE PERCENT DIFFERENCE: A measure of the precision of duplicate sample pairs, calculated using the following equation:

RPD =
$$\frac{|X_1 - X_2|}{(X_1 + X_2)/2} \times 100\%$$

where X_1 and X_2 are paired duplicate values.

SAC: Strategic air command.

- SAND: Particles of sediment having diameters larger than 1/16 mm (62 microns) and smaller than 2 mm.
- SANITARY LANDFILL: A land disposal site using an engineered method of disposing solid wastes on land in a way that minimizes environmental hazards.
- SATURATED ZONE: That part of the earth's crust in which all voids are filled with water.
- SCS: U.S. Department of Agriculture Soil Conservation Service.
- Se: Selenium.
- SILT: Sediment particles having diameters larger than 1/512 mm (2 microns) and smaller than 1/16 mm (62 microns).
- SLUDGE: The solid residue resulting from a manufacturing or wastewater treatment process that also produces a liquid stream.
- $SO_{\mu}^{=}$: Sulfate.
- SOIL GAS SURVEY: A method of collecting and analyzing volatile organic vapors in the soil to evaluate contamination problems.
- SOLID WASTE: Any garbage, refuse, or sludge from a waste treatment plant, water supply treatment, or air pollution control facility and other discarded material, including solid, liquid semisolid, or contained gaseous material resulting from industrial, commercial, mining, or agricultural operations and from community activities. This does not include solid or dissolved materials in domestic sewage, solid or dissolved materials in irrigation return flows, industrial discharges that are point sources subject to permits under Section 402 of the Federal Water Pollution Control Act, as amended (86 USC 880), or source, special nuclear, or by-product material as defined by the Atomic Energy Act of 1954 (68 USC 923).
- SOUTH FORK GRAVELS: A stratigraphic section deposited by the ancestral south fork of the American River, which is comprised of well-rounded pebbles and cobbles in a matrix of iron-cemented sand and clay with areas of hardpan in surface soils.
- SOW: Statement of work.
- SPECIFIC RETENTION: The ratio of the volume of a liquid that, after being saturated, will retain against the pull of gravity to its own volume. It is stated as a percentage.
- SPIKE: A quality control check consisting of a chemical or solution of a known concentration presented to the lab for analysis as an unknown, or the addition of a known quantity of analyte to a sample by the analyst to assess method accuracy.

- SPILL: Any unplanned release or discharge of a hazardous substance onto or into the air, land, or water.
- SPLIT SAMPLE: A second sample taken from the same site as the original sample to assess sampling and/or laboratory precision; a duplicate sample.
- STATIC WATER LEVEL: The elevation of the water table, a surface along which the hydrostatic pressure equals the atmospheric pressure.
- STORAGE OF HAZARDOUS WASTE: Containment, either temporarily or for a longer period, in a manner that does not to constitute disposal.
- STP: Sewage treatment plant.
- STRATIGRAPHY: The science of the description, correlation, and classification of strata in sedimentary rocks, including the interpretation of the depositional environments of those strata.
- SWL: Static water level.
- 1,1,1-TCA: 1,1,1-Trichloroethane.
- TCE: Trichloroethene, trichloroethylene.
- TOXICITY: The ability of a material to produce injury or disease upon exposure, ingestion, inhalation, or assimilation by a living organism.
- TRACER RESEARCH CORPORATION: Company selected to perform soil gas surveys at Mather Air Force Base.
- TREATMENT OF HAZARDOUS WASTE: Any method, technique, or process, including neutralization, designed to change the physical, chemical, or biological character or composition of any hazardous waste so as to neutralize the waste or render it nonhazardous.
- UNCONFORMABLE CONTACT: A transition between strata in which the natural succession has been disturbed or interrupted; unconformity is said to occur as a result of uplift of a formerly subsiding area and its later re-submergence so that younger strata bury the older strata.
- UNSATURATED ZONE: Zone above the water table. Most of the time, the pore space between soil particles in this zone is filled with air, except near grain-to-grain boundaries where surface tension maintains a film of water between the particles.
- UPGRADIENT: In the direction of increasing hydraulic static head; the direction opposite the prevailing flow of ground ster.
- USAF: United States Air Force.
- USGS: United States Geological Survey.

- VICTOR FORMATION: A stratigraphic section comprised of heterogeneous fluvial clay-to-gravel sediments. It also contains lenticular deposits from banded streams and is mostly made up of silty sand.
- VOA: Volatile organic analysis, purgeable fraction of priority pollutants.
- VOC: Volatile organic chemical.
- VOLATILE COMPOUNDS: Those materials whose vapor pressures are sufficiently high that they may become concentrated in any gaseous phase that forms; readily vaporizable.
- WATER TABLE: Surface of a body of unconfined groundwater at which the pressure is equal to that of the atmosphere.
- WELL DEVELOPMENT: The process by which a well is swabbed and pumped until the water produced is free of sediment.
- WELL SCREEN: The portion of the well casing that is situated in the waterbearing strata and contains .02-inch slits to allow groundwater to enter the well.

APPENDIX B

Scope of Work

C

1

INSTALLATION RESTORATION PROGRAM

PHASE II - STAGE 3

MATHER AFB CA *

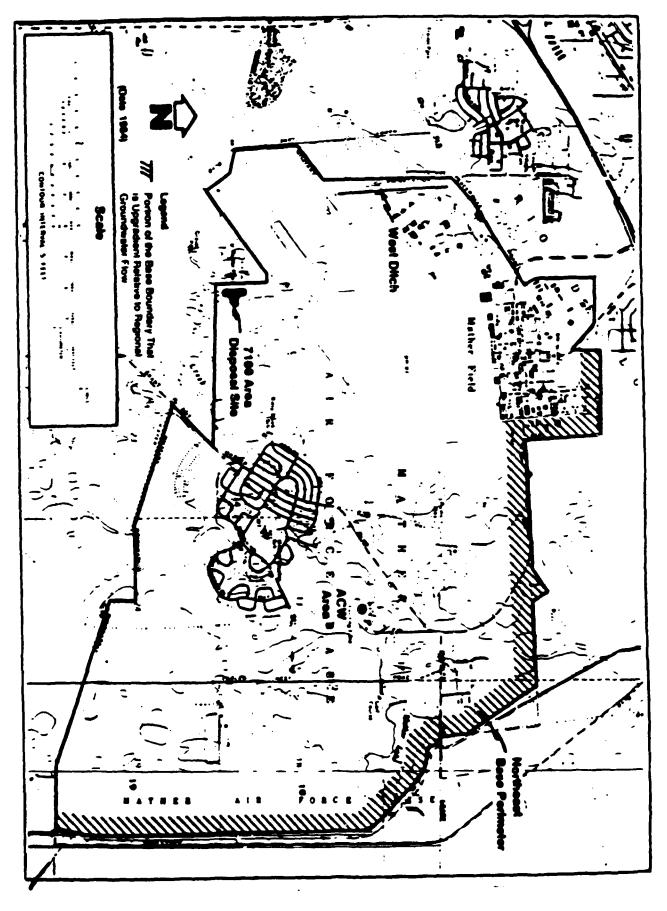
I. DESCRIPTION OF WORK

This is the follow-on investigation at Mather AFB to evaluate Site No. 7-7100 Disposal Area, Site No. 12-ACW Disposal Site, and Site No. 15-West Ditim Area (see Figure 1). Additional work at the northeast perimeter and water sampling from base wells will also be accomplished. The purpose of this task is to: (1) help determine the magnitude of contamination and the extent of migration of contaminants in the various environmental media; (2) identify potential environmental and health risk consequences of migrating pollutants based upon State or Federal standards for those contaminants; and (3) identify follow-on investigations necessary to determine the magnitude, extent, direction and rate of contaminant migration.

The Phase I IRP Report and Phase II Stage 1 Report (mailed under separate cover) incorporate the background and description of the sites for this task. To accomplish this survey effort, take the following actions:

A. General

- 1. Monitor the ambient air during all well drilling and test pit work with a photoionization meter or equivalent organic vapor detector to identify the generation of potentially hazardous and/or toxic vapors or gases. Include air monitoring results in the boring logs. If soil encountered during drilling work is suspected to be hazardous because of discoloration, odor or air monitoring, containerize the soil cuttings in new, unused drums. Enter into the boring logs the depth(s) from which suspected contaminated soil cuttings were collected for containerization.
- 2. Determine the exact field location of all monitor wells during the planning/mobilization phase of the field investigation. Consult with base personnel to minimize disruption of base activities, to properly position wells with respect to exact site locations, and to avoid underground utilities. The senior on-site contract representative, in consultation with the USAFOEHL program manager, establishes the final well locations. The senior on-site contract representative shall direct the drilling and sampling and maintain a detailed log of the conditions and materials penetrated during the course of the work. A registered geologist or professional civil engineer, or a hydrogeologist, shall be responsible for the well drilling and logging.
- 3. Provide on site analysis of pH, temperature, and specific conductance for all water samples collected. Comply with the following references concerning sample collection, maximum holding time, sample



F33615-83-D-4000/001201

preservation, etc.: Standard Methods for the Examination of Water and Wastewater, 16 Ed.-(1985), pp. 37-44; ASTM, Section 11, Water and Environmental Technology; Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater, EPA-600/4-82-057; and Methods for Chemical Analysis of Waters and Wastes, EPA Manual 600/4-79-020, pp. xiii to xix (1983). Meet the required detection limits of the applicable EPA method identified in Table 3 for all water and soil chemical analyses.

4. Split all water and soil samples. Analyze one set and immediately deliver the other set (the same collection day) to the field government point of contact (POC). The POC at Mather AFB is the Bioenvironmental Engineer (BEE). The BEE selects 10% of the split samples, packages them for shipment and notifies the contractor they are ready for shipment. Supply all packing and shipping materials for the BEE's use in packaging the split samples. Ensure the split (10%) samples are shipped not later than the day following collection. Forward the samples through overnight delivery to:

USAFOEHL/SA Bldg 140 Brooks AFB TX 78235-5501

Include the following information with the samples sent to the USAFOEHL:

- a. Purpose of sample (analyte)
- b. Installation name (Base)
- c. Sample number (on container)
- d. Source/location of sample
- e. Contract Task Numbers and Title of Project
- f. Method of collection (bailer,, suction pump, air-lift pump,
 etc.)
 - g. Volumes removed before sample taken (water samples only)
 - h. Special Conditions (use of surrogate standard, etc.)
 - i. Preservatives used (indicate if nonstandard)
 - j. Date and time of sampling
 - k. Sampler's name

Forward this information with each sample by properly completing an AF Form 2752A, "Environmental Sampling Data" and/or AF Form 2752B "Environmental Sampling Data - Trace Organics", working copies of which have

been provided under separate cover. Label each sample container to reflect the data in a, b, c, j and k. In addition, copies of field logs documenting sample collection should accompany the samples.

5. Installation of Groundwater Monitoring Wells

- a. Comply with the U.S. EPA Publication 330/9-S1-002, NEIC Manual for Groundwater/Subsurface Investigations at Hazard Waste Sites for monitoring well installation.
- b. All well drilling, development, purging, sampling methods, and other activity pertaining to this effort must conform to State and other applicable regulatory agency requirements.
- c. Install wells at a sufficient depth to collect samples representative of aquifer quality and to intercept contaminants if they are present.
- d. Drill and install all monitoring wells using the following specifications:
- (1) Drill wells using conventional mud rotary techniques. If drilling fluid additives such as bentonite or polymers are used, ensure their components will not interfere with the chemical analyses to be performed on samples. Biodegradable organic drilling fluid additives are not permitted. Prior to well completion, flush all boreholes constructed with mud rotary equipment with water from the installation drinking water system.
- (2) Take lithologic samples at five foot intervals and prepare borehole log descriptions. Include pilot boring logs and well completion summaries in the Final Report (Item VI, below).
- (3) Following the completion of each borehole, and before well construction, E-log the borehole. Include E-log data in the Final Report (Item VI below).
- (4) Prevent cross contamination between aquifers by using a dual casing system. Where wells extend through the most shallow aquifer and into a deeper aquifer, install an outer conductor casing into the confining layer below the shallow aquifer. Grout the annular space to the surface with bentonite.
- (5) Maintain an annular space between the borehole and well casing at three to five inches. Use centralizers to guarantee the casing is centered; install centralizers at the top and bottom of the screened interval and at 40 foot spacing for blank casing.
- (6) Construct wells using four inch inside diameter (ID) low carbon steel. Use threaded screw type joints, do not use glue or solvents at the fittings. Screen 20 feet in each well using four inch ID stainless steel

(wire wound) well screen having up to 0.020 inch slots; slot size may be smaller based upon-borehole geology. Screen all wells so as to collect floating contaminants and to allow for yearly fluctuation of the water table.

- (7) Drill and construct a maximum of 35 wells. Install a five to ten foot blank casing section below the screened interval; cap the bottom of this blank casing. Well installation shall not exceed 6,500 feet.
- (8) Shallow wells referenced in this effort define those wells constructed to collect groundwater from the first, most shallow, aquifer. Deep wells are those drilled into the next deeper aquifer, the one below the shallow aquifer. Well clusters consist of both a shallow and a deep well unless specified otherwise in Section B.
- (9) Gravel-pack the annulus of each well to a height of five feet above the top of the well screen. Once the casing is installed, remove the drilling bit and allow the soil formation to collapse around the well screen. Supplement the natural gravel pack with washed and bagged rounded sand or gravel having a grain size distribution compatible with the screen and soil formation. Install a three to five foot bentonite 1/4" pellet seal above the gravel pack and an additional three to five foot bentonite 8-20 granular mesh seal above the pellet seal. Ensure the bentonite forms a complete seal. Grout the remainder of the annulus to the surface with the following mixture: five gallons of water with two to five pounds of bentonite per 94 pound bag of cement.
- (10) Develop each well as soon as practical after completion by using a combination of a vented surge block and submersible pump. Continue well development until the discharge water is clear and free of sediment to the fullest extent possible, and the pH, temperature and specific conductance have stabilized. Measure the rate of water produced during well development and include this information in the report.
- (11) Base officials determine which method is used to complete the well surface:
- (a) If well stick-up is of concern in an area, complete the well flush with the land surface. Cut the casing two to three inches below land surface and cement a protective locking lid in place. The protective lid shall consist of a cast iron valve box assembly centered in a three foot diameter concrete pad sloped away from the valve box. Ensure that free drainage is maintained within the valve box. Also, provide a screw-type casing cap to prevent infiltration of surface water. Maintain a minimum of one foot clearance between the casing top and the bottom of the valve box. Clearly mark the well number on the valve box lid.
- (b) If an above ground surface completion is used, extend the well casing two or three feet above land surface. Provide an end-plug or casing cap for each well. Shield the extended casing with a steel guard pipe which is placed over the casing and cap, and seated in a four foot by four foot by four inch concrete surface pad. Slope the pad away from the well sleeve. Install a lockable cap or lid at the casing. Install three,

three inch diameter steel guard posts if the base determines the well is in an area which needs such protection. The guard posts shall be six feet in total length and installed radially from each wellhead. Recess the guard post approximately two feet into the ground. Paint the protective steel sleeve and clearly number the well on the sleeve exterior.

- (c) Provide locks for both flush and above ground well assemblies. Turn over the lock keys to the base POC following completion of the field effort.
- (12) Determine by survey the elevation of all newly installed monitoring wells to an accuracy of 0.01 feet. Horizontally locate the new wells to an accuracy of 1.0 feet and record the position on both project and site specific maps. Bench marks used must have previously been established from and are traceable to a USCGS/USGS survey marker.
- (13) Measure water levels at all monitoring wells, including those constructed during Stage 2, as feet below the ground surface, or below the top of casing elevation, to the nearest 0.01 feet. Report elevations in terms of mean sea level. Measure static water levels in wells prior to sampling and well development.
- 6. Allow wells to stabilize after development for a minimum of 30 days before sampling. Purge wells prior to sampling until a minimum of five well volumes of water have been displaced and the pH, temperature, specific conductance, color, and odor of the discharge have stabilized. Use a submersible pump or bladder pump to purge wells. Sample using a Teflon or stainless steel Kemmerer sampler.
- 7. If the well(s) cannot be sampled due to well development, well characteristics, or other reason(s), indicate the reason(s) in the report specified in Item VI below.
- 8. Collect and analyze two rounds of water samples from all groundwater monitoring wells. Collect the initial sample 30 days after well development and the second sample approximately 30 days later. For groundwater monitoring wells installed prior to this effort, but which will be sampled again during this study, also collect two rounds of water samples with approximately 30 days between sample rounds. Collect sample rounds from all wells during the same period (within a two to three day window). During sample collection from all wells, examine the surface of the water table for the presence of hydrocarbons and, if applicable, measure the thickness of the hydrocarbon layer.

9. Chemical Analyses

- a. Analyze water and soil samples collected as specified in Section B below, Specific Actions, and summarized in Table 1. The analytical parameters are summarized in Table 3 along with the required methods.
- b. Analyses shall meet the required limits of detection for the applicable EPA method identified in Table 3.

- c. For those methods which employ gas chromatography (GC) as the analytical technique (E601, SW8010, SW8020, SW8080) positive confirmation of identity is required for all analytes having concentrations higher than the Method Detection Limit (MDL). Conduct positive confirmation by second-column GC: however, gas chromatography/mass spectroscopy (GC/MS) can be used for positive confirmation if the quantity of each analyte to be confirmed is above the detection level of the GC/MS instrument. Analytes which cannot be confirmed will be reported as "Not Detected" in the body of the report, but results of all second-column GC or GC/MS confirmational analyses are to be included in the report appendix along with other raw analytical data. Base the quantification of confirmed analytes upon the first column analysis. The maximum number of second-column confirmational analyses shall not exceed fifty percent (50%) of the actual number of field samples (to include duplicates). The total number of samples for each GC method listed in Table 1 includes this allowance. If GC/MS, or a combination of second-column GC and GC/MS, is used. the total cost of all such analyses for a particular parameter shall not exceed the funding allowed for positive confirmation using only second-column GC.
- d. All chemical/physical analyses shall conform to State and other applicable Federal and local regulatory agencies' legal requirements. If a regulatory agency requires that an analysis or analyses be performed in a certified laboratory, assure compliance with the requirement by furnishing documentation showing laboratory certification with the first analytical results to USAFOEHL/TS.
- 10. For every 10 field samples collected, take one additional sample (a duplicate of the 10) for quality control purposes. Table 1 provides a 10% allowance for these additional analyses. Include all quality control data in the draft final reports. Duplicates shall be indistinguishable from other analytical samples such that personnel performing the analyses should not be able to determine which samples are duplicates.
- 11. For every 20 field water samples per parameter, prepare and submit one additional field blank for analysis for all parameters in water. Allowances for these additional analyses are included in Table 1.
- 12. Complete and maintain chain-of-custody records for all samples, field blanks, and quality control duplicates.
- 13. Plot and map all field data collected for each site according to surveyed positions. Identify or estimate the nature of contamination and the magnitude and potential for contaminant flow within each site to receiving streams and groundwater.
- 14. Remove all well borehole cuttings and clean the general area following the completion of each well. Properly containerize cuttings suspected of being hazardous waste (based on discoloration, odor, organic vapor detection instrument). Test the suspected hazardous waste for EP Toxicity and Ignitibility. Transport the drums containing suspected contaminated soils to a location on Mather AFB designated by base officials. The base is responsible for ultimate disposal of contaminated soils using base resources; adhere to RCRA guidelines.

- 15. Decontaminate all sampling equipment prior to use and between samples to avoid cross contamination. Wash equipment with a laboratory-grade detergent followed by clean water, and distilled water rinses. Dedicate a monofilament line or steel wire used to lower samplers for each well; do not use a line in more than one well. The calibrated water level indicator for measuring well volume and fluid elevation must be decontaminated before use in each well.
- 16. Thoroughly clean and decontaminate the drilling rig and tools before initial use and after each borehole completion. As a minimum, steam clean drill bits after each borehole is installed. Drill from the <u>least</u> to the <u>most</u> contaminated areas, if possible.
- 17. Conduct a literature search of local hydrogeologic conditions to complement the Phase I and Phase II Reports (mailed under separate cover). Use this data to determine optimum well locations. Include the pertinent literature search information in Appendix D of the Final Report. Develop the literature search data using the following guideline:
 - a. Topographic data
 - b. Geologic data
 - (1) Structure
 - (2) Stratigraphy
 - (3) Lithology
 - c. Hydrologic data
- (1) Location of existing and abandoned wells, including observation wells, and springs, natural ponds, and seepages within a one-mile radius of sites to be investigated
 - (2) Groundwater table and piezometric contours
 - (3) Depth to groundwater
 - (4) Surface and groundwater quality
 - (5) Recharge, discharge and contributing areas
- (6) Geologic setting, yield and hydrographs of springs and natural seepages.
- d. Data on existing and abandoned wells, to include observation wells, within a one-mile radius of sites to be investigated
 - (1) Location, depth, diameter, types of wells, and logs
 - (2) Static and pumping water level, hydrographs, yield,

specific capacity, quality of water

- (3) Present and projected groundwater development and use
- (4) Corrosion, incrustation, well interference, and similar operation and maintenance problems
 - (5) Observation well networks
 - (6) Existing water sampling sites

e. Aquifer data

- (1) Type, such as unconfined, artesian, or perched
- (2) Thickness, depth, and formational designation
- (3) Boundaries
- (4) Transmissivity, storativity, and permeability
- (5) Specific retention
- (6) Discharge and recharge
- (7) Ground and surface water relationships
- (8) Aquifer models

f. Climatic data

- (1) Precipitation (total and net)
- (2) Evapotranspiration
- B. In addition to the general items delineated in A above, conduct the following specific actions:
 - 1. Site No. 12 ACW Disposal Site
- a. Conduct an intensive file search, review of building plans and aerial photography, and interviews of personnel to narrow the area of search.
- b. Perform a combined ground penetrating radar and magnetometer survey over a 25-foot grid to identify conductive or magnetic anomalies in the shallow subsurface. Supplement this effort in suspect areas with a fine grid survey in order to locate the pipe. A maximum of three days is authorized for these geophysical surveys.
- c. Conduct a soil gas monitoring program designed to measure the concentration of TCE in the shallow subsurface beneath the site by sampling soil gas at several points in an array and executing in situ analyses for TCE. Develop a contour map of TCE concentrations in soil within a short time

frame to enable the near-surface plume to be more clearly defined. After completing the first "sweep" of soil gas sampling, establish a soil gas monitoring fine grid in the area of highest concentration and repeat the process in this smaller area to further narrow the area of investigation. A maximum of four days is authorized for the soil gas survey.

- d. Based upon the information gathered during the geophysical and soil gas surveys, and the Phase II Stage 1 study, drill and install three twowell clusters downgradient (southwest) of the ACW area. Position these well clusters approximately one-half the distance between the ACW site and the family housing area which is to the southwest.
- e. Drill and install another two-well cluster upgradient (northeast) of the ACW site to be used for background information.
- f. Drill and install one shallow (first aquifer) well northwest of MAFB-1.
- g. Drill and install two deep wells, one each in the immediate vicinity of MAFB-1 and MAFB-2. Screen these wells in the same aquifer as the deactivated ACW production well. Install a dual casing system, as needed, to prevent aquifer cross-contamination.
- h. Collect two rounds of groundwater samples from the eleven monitor wells installed during this effort and the three existing monitor wells (MAFB-1, MAFB-2 and MAFB-3). Analyze the samples for common ions and minerals, and VOA compounds; see Table 1.

2. Site No. 7 - 7100 Disposal Area

- a. Conduct an electromagnetic survey of the ground surface downgradient from the landfill. This necessitates off-base survey work. Conduct the survey at three separate spacings to provide vertical and lateral definition for subsurface conductivity. Based upon the difference in specific conductance, attempt to track the plume of mineralized groundwater emanating from the landfill area.
- b. Conduct a soil gas monitoring program designed to measure the concentration of TCE in the shallow subsurface beneath the site by sampling Poil gas at several points in an array and executing in situ analyses for ICE. Develop a contour map of TUE concentrations in soil within a short time frame to enable the near-surface plume to be more clearly defined. After completing the first "sweep" of soil gas sampling, establish a soil gas monitoring fire grid in the area of highest concentration and repeat the process in this smaller area to further narrow the area of investigation. maximum of one day is authorized for the soil gas survey.
- c. Drill and install four two-well clusters downgradient of the site. Position the wells as follows:
- (1) One well cluster southwest of the JTC well and adjacent to, but inside, the installation boundary.

- (2) Three well clusters downgradient of the currently installed monitor wells (MAFB-7, MAFB-8 and MAFB-9); these well clusters will be outside the installation boundary.
- d. Drill and install one deep well in the immediate vicinity of MAFB-8.
- e. Drill and install three shallow wells (first aquifer) and position them as follows:
- (1) One well directly between the existing Fire Department Training Area (FDTA) Site 11 and the 7100 Area.
- (2) One well upgradient of the 7100 Area, and between the 7100 Area and the abandoned Sewage Treatment Plant (STP) oxidation ponds.
 - (3) One well upgradient of the STP oxidation ponds.
- f. Collect two rounds of groundwater samples from the 12 monitor wells installed during this effort and the three existing monitor wells (MAFB-7, MAFB-8 and MAFB-9). Analyze all samples for common ions and minerals, VOA compounds, metals and cyanids. Also analyze samples from the well between the landfill and FDTA for petroleum hydrocarbons and phenol.

3. Site No. 15 - West Ditch Area

- a. Drill and install two two-well clusters, positioned as follows:
- (1) One well cluster directly west of the oil skimmer, adjacent to and inside the installation boundary.
- (2) One well cluster directly north of MAFB-10, adjacent to and inside the installation boundary where the perimeter fence meets Old Placerville Road.
- b. Drill and install two deep wells (second aquifer), one each in immediate vicinity of existing monitor wells MAFB-10 and MAFB-11.
- c. Drill and install one shallow well in the immediate vicinity of the Base Commissary (Bldg No. 1200).
- d. Collect two rounds of groundwater samples from the seven monitor wells installed during this effort and the two existing monitor wells (MAFB-10 and MAFB-11). Analyze all samples for VOA compounds, and common ions and minerals.

4. Northeast Perimeter

- a. Drill and install three deep wells (second aquifer) in the immediate vicinity of MAFB-4, MAFB-5 and MAFB-6.
- b. Drill and construct one shallow monitoring well (first aquifer) near existing well MAFB-4.
- c. Drill and construct one shallow monitoring well (first aquifer) near existing well MAFB-6.
- d. Collect two rounds of groundwater samples from the <u>five</u> monitor wells installed during this effort and the <u>*xisting monitor well</u>
 <u>MAFB-5A.</u> Analyze all samples for VOA compounds, and common ions and minerals.

5. Base Wells

Collect one round of water samples from 8 base wells. Analyze all samples for VOA compounds, and common ions and minerals.

C. Field Coordination

- 1. Notify the Mather AFB POC at least one week in advance of any work to be accomplished outside of the installation boundary.
- 2. Notify the USAFOEHL and Mather AFB POCs at least five days in advance of water sample collection dates.

D. Technical Operations Plan

Within two (2) weeks after the Notice to Proceed for the delivery order, submit a Technical Operations Plan (TOP) based on the technical requirements specified in this task description for the proposed effort. (See Sequence No. 19, Item VI below). Follow the TOP format (mailed under separate cover).

E. Health and Safety

Comply with all applicable USAF, OSHA, EPA, State and local health and safety regulations regarding the proposed work effort. Use EPA guidelines for designating the appropriate levels of personal protection needed at the study sites. Prepare a written Health and Safety Plan for the proposed work effort and coordinate it directly with regulatory agencies prior to commencing field operations. Provide an information copy of the Health and Safety Plan to the USAFOEHL after coordination with regulatory agencies. The Health and Safety Plan is specified in Sequence No. 7, Item VI below.

F. Data Review

1. Tabulate field and analytical laboratory results, including field and laboratory parameters and QA/QC data, as they become available and incorporate them into the next monthly R&D Status Report (Sequence No. 1, Item

IV below) forwarded to the USAFOEHL. In addition to the results, report the following:

- a. the time and dates of sample collection, extraction (if applicable) and analysis;
 - b. the method used and Method Detection Limits achieved;
 - c. the Chain-of-Custody forms;
- d. a cross-reference of laboratory sample numbers and field sample numbers; and
- e. a cross-reference of field sample numbers to wells, boreholes, sites, etc.
- 2. Upon completion of all analyses, tabulate and incorporate all results into an Informal Technical Information Report (Sequence No. 3, Item VI below) and forward the report to USAFOEHL for review a minimum of two weeks prior to submission of the draft report. Provide as a minimum the information specified in I.F.1 above.
- 3. Immediately report to the USAFOEHL Program Manager or his supervisor via telephone, data/results generated during this investigation which indicate a potential health risk (for example, a contaminated drinking water aquifer). Follow the telephone notification with a written notice and laboratory raw data (e.g. chromatogram) within three days.

G. Reporting

- 1. Prepare a draft report delineating all findings of this field investigation and forward it to the USAFOEHL (as specified in Sequence No. 4, Item VI below) for Air Force review and comment. Strictly adhere to the USAFOEHL report format (mailed under separate cover). Draft reports are considered "drafts" only in the sense that they have not been reviewed and approved by Air Force officials. In all other respects, "drafts" must be complete, in the proper format, and free of grammatical and typographical errors. Include a discussion of the regional/site specific hydrogeology, well and boring logs, data from water level surveys, groundwater surface and gradient maps, water quality and soil analysis results, soil gas data, available geohydrologic cross sections, and laboratory and field QA/QC information. Use all available Phase II information from Stages 1, 2, and 3. Follow the USAFOEHL supplied format (mailed under separate cover). The format is an integral part of this delivery order. For States requiring the field work or technical effort be supervised by a State registered geologist, engineering geologist or professional engineer, insert information in the report to include registration numbers, certificates and seals (as appropriate).
- 2. Review the results, conclusions and recommendations concerning the sites listed in this task which were investigated during a previous IRP Phase II staged work effort. Use this information and data from previous efforts to establish trends and develop conclusions and recommendations. Integrate all

investigative work done at each site to date so the report reflects the total cumulative information for each site studied in this effort.

- 3. In the Results Section, include water and soil analyses results and field quality control sample data. Internal laboratory quality control data (lab blanks, lab spikes and lab duplicates), and laboratory quality assurance information should be in Appendix H. Provide second column confirmation results and include which columns were used, instrument operating conditions and retention times. Summarize in the Appendix the specific collection technique, analytical method, holding time, and limit of detection for each analyte (Standard Method, EPA, etc.).
- 4. Make estimates of the magnitude, extent and direction which detected contaminants are moving. Identify potential environmental consequences of discovered contamination, where known, based upon State or Federal standards.
- 5. In the Recommendation Section, address each site and list them by category:
- a. Category I consists of sites where no further action (including remedial action) is required. Data for these sites are considered sufficient to rule out unacceptable public health or environmental hazards.
- b. Category II sites are those requiring an additional Phase II effort to determine the direction, magnitude, rate of movement and extent of detected contaminants. Identify potential environmental consequences of discovered contamination, where known.
- c. Category III sites are those that will require remedial action (ready for IRP Phase IV). In the recommendations for Category III sites. include any possible influence on sites in Categories I and/or II due to their connection with the same hydrological system. Clearly state any dependency between sites in different categories. Include a list of candidate remedial action alternatives, including Long Term Monitoring (LTM) as remedial action, and the corresponding rationale that should be considered in selecting the remedial action for a given site. List all alternatives that could potentially bring the site into compliance with environmental standards. For contaminants that do not have standards, EPA recommended safe levels for noncarcinogens (Health Advisory or Suggested-No-Adverse-Response Levels) and target levels for carcinogens (1 x 10^{-6} cancer risk level) may be used. Unless specifically requested, do not perform any cost analyses, or cost/benefit review for remedial action alternatives. However, in those situations where field survey data indicate immediate corrective action is necessary, present specific, detailed recommendations.

For each category above, summarize the results of field data, environmental or regulatory criteria, or other pertinent information supporting conclusions and recommendations. Put this summary information into a table and insert the table(s) into the text and the Executive Summary.

6. Provide cost estimates by line item for future efforts recommended for Category II sites and LTM Category III sites. Submit these estimates

concurrently with the approved final technical report in a separate document. Only the cost requirement outlined in Sequence No. 2, Item VI, need be submitted.

- a. For Category II sites, develop detailed site-specific estimates using prioritized costing format (i.e., cost of conducting the required work on: the highest priority site only; the first two highest priority sites only; the first three highest priority sites only; etc., until all required work is discretely costed) for the proposed work effort. The Air Force determines the priority of sites from contractor recommendations. Consider the type of contaminants, their magnitude, the direction and rate of their migration, and their subsequent potential for environmental and health consequences when developing recommendations for site prioritization.
- b. For Category III sites slated for long-term monitoring, develop site-specific estimates which detail the cost associated with: (1) permanent installation of monitoring wells; (2) groundwater sampling interface equipment, including permanent installation of pumps and sampling lines; and (3) four quarterly (1 year period) sample collections and laboratory chemical analyses of groundwater, etc.
- 7. Provide an inventory of all on-base wells, to include production, irrigation, monitoring, etc. If the well has been abandoned, note the reason.
- 8. Reference in an appendix any local, State and/or Federal regulations which require specific well drilling techniques, materials, well development, purging, and sampling methods.

H. Meetings

The contractors project leader shall attend three meetings to take place at a time to be specified by the USAFOEHL. Each meeting shall take place at Mather AFB for a duration of one day (eight hours).

I. Applications and Permits

Complete the "Application and Water Well Job Permit," and the "Application for Encroachment Permit" and all other forms and permits necessary for the installation of wells outside of the installation boundary. File all forms with appropriate agencies.

II. SITE LOCATION AND DATES

Mather AFB CA Dates to be established

III. BASE SUPPORT

- A. Prior to any contractor digging or drilling, locate underground utilities and issue digging permits.
 - B. Store and dispose of contaminated drill cuttings.
- C. Obtain easements for performing a geophysical survey, and drilling and constructing monitor wells downgradient of the 7100 Area Disposal Site (Site 7).
- D. Provide the contractor with existing engineering plans, drawings, diagrams, aerial photographs, etc., as needed to evaluate sites under investigation.
- E. The base BEE selects 10% of the split samples provided by the contractor, packages them, and ensures they are picked up by the contractor within 24 hours of sample receipt by the POC. See paragraph 1.A.4.
- IV. GOVERNMENT FURNISHED PROPERTY: None
- V. GOVERNMENT POINTS OF CONTACT:
 - USAFOEHL/TX Brooks AFB TX 78235-5501 (512) 536-2158 AV 240-2158 1-800-821-4528
 - 1. Capt David P. Gibson, Jr. 2. Capt James P. Curran USAF Hospital Mather/SGPB Mather AFB CA 95655-5000 (916) 364-2284 AV 828-2284
 - 3. Lt Col Ronald Schiller 4. MSgt Patricia A. Sparks Hq ATC/SGPB Randolph AFB TX 78150-5001 (512) 652-5271 AV 487-5271
 - USAF Hospital Mather/SGPB Mather AFB CA 95655-5000 (916) 364-2284 AV 828-2284
- VI. In addition to sequence numbers 1, 5, and 11 listed in Attachment 1 to the contract, and which apply to all orders, the sequence numbers listed below are applicable to this order. Also shown are dates applicable to this order.

Sequence No.	Para No.	Block 10	Block 11	Block 12	Block 13	Block 14
19 (TOP)*	I.D.	OTIME	86 Jul 30	86 Aug 15		15
7 (Health & Safety)	I.E.	OTIME	86 Jul 30	86 Aug 15		3
3 (Prelim Data)	I.F.2	OTIME		***		3
4 (Tech Rpt)	I.G.	ONE/R	86 Nov 15	86 Nov 28	87 Jun 30	**
14		MONTHLY	86 Aug 15	86 Aug 15	***	3
15		MONTHLY	86 Aug 15	86 Aug 15	****	3
2 (Cost Data)	I.G.6	OTIME	87 Mar 02	87 Jun 30		****

^{*}The Technical Operations Plan (TOP) is due within 2 weeks of the Notice to Proceed.

^{**}Two draft reports (25 copies of each) and one final report (50 copies plus the original camera ready copy) are required. Incorporate Air Force comments into the second draft and final reports as specified by the USAFOEHL. Supply the USAFOEHL with a final copy of the first draft, second draft, and final reports for acceptance prior to distribution. Distribute the remaining 24 copies of each draft report and 49 copies of the final report as specified by the USAFOEHL.

^{****}Upon completion of the total analytical effort and before submission of the first draft report.

^{****}Submit monthly thereafter.

^{*****}Submit cost estimates in a separately bound document for Category II and Category III, Long Term Monitoring, sites. Provide this document (five copies) with the Final Report only.

TABLE 1

SAMPLING AND ANALYTICAL REQUIREMENTS HATHER AFB

Analyte	Medium			Sites					
		12 (ACW)	7 (7100)	15 (W. Ditch)	15 Northeast (W. Ditch) Perimeter	Northeast Production Perimeter Wells	8	2nd Column Confirmation	Totel
VOA 1	Water	28	30	18	21	∞ 1	15	% 1	व
Petroleum Hydro- Water carbons	Water	0	~	0	0	0	۷.	N	ਕ
Phenol	Water	0	~	0	0	0	5	N N	3
Common Ions ² and Minerals ³	Water	58	30	18	21	∞ι	শ্ৰ	K X	=1
Hetals"	Water	0	30	0	0	0	\$	N N	35
Cyanide	Water	0	କ୍ଷା	0	0	0	2	NA	81

NOTES: 'See Table 2

²Chloride, sulfate, nitrate, bromide, fluoride, nitrite and phosphate

*Arsenic, barium, cadmium, chromium, lead, mercury, selenium and silver

*Assumes 50% of Method E601, SW8010, SW8020 and SY4080 nampler will requira second column confirm tion

^{*}Bicarbonate, carbonate and hydroxide alkalinity, calcium, magnesium, iron, manganese, sodium, total dissolved solids and total hardness

^{*}QA is 10% of the basic sample load plus a field blank for every 20 water samples per parameter

TABLE 2

VOLATILE ORGANIC AND AROMATIC COMPOUNDS (VOA)

Purgeable Halocarbons EPA Methods 601 and 8010

Bromodichloromethane Bromoform Bromomethane Carbon tetrachloride Chlorobenzene Chloroethane 2-Chloroethylvinyl ether Chloroform Chloromethane Dibromochloromethane 1,2-Dichlorobenzene 1,3-Dichlorobenzene 1,4-Dichlorobenzene Dichlorodifluoromethane 1.1-Dichloroethane 1,2-Dichloroethane 1,1-Dichloroethene trans-1,2-Dichloroethene 1,2-Dichloropropane cis-1,3-Dichloropropene trans-1,3-Dichloropropene Methylene chloride 1,1,2,2-Tetrachloroethane Tetrachloroethylene 1,1,1-Trichloroethane 1,1,2-Trichloroethane Trichloroethylene Trichlorofluoromethane Vinyl Chloride

Purgeable Aromatics EPA Method 8020

Benzene
Chlorobenzene
1,2-Dichlorobenzene
1,3-Dichlorobenzene
1,4-Dichlorobenzene
Ethylbenzene
Toluene

TABLE 3

Analytical Parameters, Methods, and Required Detection Limits

Parameter	Method	Detection Limit
Petroleum Hydrocarbons - water (IR analysis)	E418.1	1 mg/L
PCB - Soil	SW3550/SW8080	1 mg/Kg
Aromatic volatile organics - water	SW8020	a
Aromatic volatile organics - soil	SW5030/SW8020	a
Halogenated volatile organics - water	E601	a
Halogenated volatile organics - soil	SW5030/SW8010	
Phenol - water	E420.1	5 μg/L
Common Anions - water	A429	0.1 mg/L
Metals and Minerals - water	E200.7	
barium cadmium calcium chromium iron lead magnesium manganese silver sodium		0.002 mg/L 0.004 mg/L 0.010 mg/L 0.007 mg/L 0.007 mg/L 0.042 mg/L 0.030 mg/L 0.002 mg/L 0.007 mg/L
Arsenic - water	E206.2	0.001 mg/L
Mercury - water	E245.1	0.0002 mg/L
Selenium - water	E270.2	0.002 mg/L
Total dissolved solids - water	E160.1	10 mg/L
Total carbonate alkalinity - water	A403	-
Bicarbonate alkalinity - water	A403	-
Hydroxide-alkalinity - water	A403	-

Specific conductance - water (field test)

pH (field test) - water E150.1
Temperature (field test) - water E170.1

^aDetection limit as specified by the applicable EPA or Standard Method

)	Metal	mg/1 of Leaching Solution
	As	0.002
	Ba	0.1
	Cđ	0.005
	Cr	0.05
	Hexavalent Cr	0.05
	Po	0.1
	Hg	0.0002
	Se	0.002
	AR	0.01

^Cfind if sample is ignitible at 140 degrees Fahrenheit or below. If so, it is a hazardous waste, in accordance with 40 CFR 261.21.

Additional Notes:

- 1. VOA refers to analysis for both Aromatic Volatile Organics and Halogenated Volatile Organics.
- 2. "A" Methods Standard Methods for the Examination of Water and Wastewater, 16th Edition (1985).
- 3. "E" Methods U.S. Environmental Protection Agency
- 4. "SW" Methods Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 2nd Edition (USEPA, 1984)
- 5. For soil samples, report results as mg/Kg of \underline{dry} soil. Report moisture content for each soil sample.

APPENDIX C

Sample Numbering System

C

C. SAMPLE NUMBERING SYSTEM

All groundwater samples collected from Mather AFB for laboratory analysis were given a six-digit code for rapid identification. The first four digits indicate the monitoring well from which the sample was collected. For example, DH-12-XX represents a sample taken from Well No. 12. DH stands for drill hole and always preceeds the well number. The thirty-five wells installed during Phase II Stage 3 range from DH-40 to DH-73 and DH-75 (Stage 1 wells were DH-1 to DH-11 and Stage 2 wells were DH-12 to DH-39 and DH-75). Base production wells are coded according to the system already established by base personnel (MB-2, HW-3, K-9, etc.)

The last two digits of the groundwater sample numbering code represent the chronological order in which a sample was taken for a specific set of parameters. Thus DH-25-G1 represents the first set of groundwater samples taken from Well 25. The last two digits take into account previous samples collected from Phase II Stage I wells.

AV quality assurance (QA) samples are numbered using the six-digit codes described above and are "blind" QA samples. This minimizes the possibility of prejudicial treatment being given to QA samples in the laboratory.

All QA samples (splits) sent to the Air Force OEHL are numbered according to the Air Force sample-numbering system outlined in Air Force Form 2752. Table C-1 correlates AV's sample codes with the USAF sample numbers, which were logged for samples sent to the OHEL laboratory.

TABLE C-1

AV Sample No.	Air Force Sample No.
DH-68-G1	GN-86-0390
DH-51-G1	GN-86-0391
DH-42-G1	GN-86-0400
DH-10-G1	GN-86-0401
DH-57-G2	GN-86-0455
DH-44-G2	GN-86-0456
DH-43-G2	GN-86-0457

APPENDIX D

I

Schematic Logs of Wells

(includes boring log for Well No. 75 which was drilled as part of Stage 2)

Well No. MAFB-40

O'Gara

Logged By _

Single Point Resistivity - Lateral Resistivity - Spontaneous Potential Geophysical Logs Checked By Napp Date 9/16/86 Well Design 1111111111111 Grout to Surface -100-Depth (ft) -110--130--120--10--80--20-0 -09-Prilling Method Conventional Mud Rotary -30--50--07--96-Graphic Log Mather Stage III Fine - to medium-grained sand Fine - to medium-grained sand Interbedded fine-grained sand and silt Gravel and cobbles in a sandy Small to medium gravel and static water level in the Geologic Description NOTE: $\underline{\underline{\mathbf{Y}}}$ is used to indicate Project Name White sandy clay Tan sandy clay Tan sandy clay Tan sandy clay AV F.HWOS TD 124 cobbles matrix well

Geophysical Logs O'Gara Checked By Napp Date 9/18/86 Logged By _ Well Design Grout to Surface Depth (ft) -110-Prilling Method Conventional Mud Rotary -100 -01--20--40-5 -09--0/--96--30-Graphic Mather Stage III Log of fine - to medium-grained sand. Has the appearance of orange colored soil - grainy texture Primarily fine-grained sand with thin grey clay interbeds Primarily clay, varying amounts Silty, clayey, fine-grained sand % ₹ ₩ Well-rounded small gravel to cobble sized clasts in a very coarse-grained sand matrix Interbedded sandy, silty and clayey material Geologic Description Project Name

AV-F-HW05

Spontaneous Potential

Lateral Resistivity

Single Point Resistivity

-120-

-130-

Interbedded sand, silt and clay

MAFB-41	Graphic Depth. Well Design	-041-	-001-	-170-	-081-	-061-	-200-	-210-	-220-	-230-	-240-	-250-	-360-	-270-	-280- Single Point Resistivity Lateral Resistivity Spontaneous Potential	
	Geologic Description	Bed of clean medium-grained	TD 150	· • • • · · · · · · · · · · · · · · · ·				-								

Well No.

Checked By O'Gara

98/61/6

Napp

Logged By

Date Conventional Mud Rotary Mather Stage III Drilling Method Project Name

Spontaneous Potential Lateral Resistivity Geophysical Logs Single Point Resistivity Well Design Grout to Surface Depth (ft) -100--011-688 -110--120--10--80--130--20-0 -09 -70--96--30-Š Graphic Log 78.9 \(\frac{78.9}{\sqrt{2}}\)
A thick interval of reddish-brown silt sand, silt and clay; interbeds are I or 2 feet thick Clast size ranges from cobble to Medium - to coarse-grained sand Interbedded medium - to coarse-Silt with fine-grained sand and pea gravel in a matrix of very coarse-grained sand Interbedded very fine-grained Very fine-grained silty sand grained sand and pea gravel Geologic Description Fine-grained silty sand AV-F-HW05 minor clay TD 133

Well No. MAISB-43

1

Logged By O'Gara/Napp

Spontaneous Potential Lateral Resistivity Geophysical Logs Checked By Napp Date 8-15-86 Single Point Resistivity Well Design Grout to Surface Depth (ft) -110--120--001--130--50 -09--08--10--20--30--04--70--96-Drilling Method Conventional Mud Rotary Log 6000 Graphic Project Name __Mather_Stage III Well-rounded gravel and cobbles Small - to medium-sized gravel in a coarse-grained sand matrix %? √ %? many stringers of silt, sand and a few pebbles Primarily brown clay with Same as above with an increase in sand content Geologic Description up to 8" in diameter Brown sticky clay AV-F-HW05 TD 133

D-5

Well No. MAFB-44

Napp

Logged By

Spontaneous Potential Lateral Resistivity Geophysical Logs Checked By O'Gara Date 8/19/86 Single Point Resistivity Well Design Grout to Surface Depth (ft) -100--120--130--50--08--10--040--09 -70--96-Prilling Method Conventional Mud Rotary Graphic Project Name Mather Stage III Gravel in a very coarse-grained sand matrix and decreasing sand with depth Primarily well-rounded cobbles Very fine - to medium-grained sand 4-8" diameter, few small - to Same as above with less sand and more silt and clay Geologic Description medium-sized gravel TD 110

AV-F-HW05

Checked By Napp/O'Gara Logged By Amber Nate 8/21/86 Well No. MAFB-45 Drilling Method Conventional Mud Rotary Project Name Mather Stage III

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				<u></u>						Potential
			ı			<i>-</i>	2			Spontaneous Potential
			M		کہم		\bigvee			Lateral Resistivity
)	~	~_ر	<u>~</u>	\checkmark			Single Point Registivity
				~~~						9
,				<b>√</b>						
	to Surface	TuonD								ë
(11)	to Surface	10012 Crout	-06-	-09-	-80-	6	-100-	-110-	-120-	-130-
Log (It)	<del></del>		-96-		-80-		-001-	-110-	-120-	130-
Log	-10- -07 Co	and in a Composition -30-	ained sandy -50-	-60-			-100-	-110-	-120-	130-
	01-02-02-02-02-02-03-03-03-03-03-03-03-03-03-03-03-03-03-		-96-		Fine - to medium-grained sand		Gravel and cobbles	TD 105	-120-	130-

AV-F-HW05

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Well No. MAFB-46

Project Name Mather Stage III

Drilling Method Conventional Mud Rotary

Logged By Napp

Checked By O'Gara

Date 9/21/86

Geophysical Logs	What was	Lateral Resistivity - Spontaneous Potential
		Single Point Resistivity
Well Design	Grout to Surface	
Depth (ft)	-10- -30- -30- -50- -50- -90- -110- -120-	-130-
Graphic Log		
Geologic Description	Very fine - to fine grained sand with silt and minor clay Medium-grained sand Gravel in coarse-grained sand matrix  Alternating 3-5' beds of sand and mixed silt and sand matrix  Clay with varying amounts of silt and clay; very hard chips of semi consolidated fines  Brown clay with minor amounts of silt  Brown clay with minor amounts of silt	

AV-F-HW05

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Project Name_Mather Stage III____

Prilling Method Conventional Mud Rotary

Logged By Amber
Checked By Napp

Pate 8/23/86

STIPS A65- STIPS Point Resistivity Lateral Resistivity		1	Grout to Surface	
Lateral Resistivity	% 0.00 G	-65-		/
				Single Point Resistivity Lateral Resistivity Spontaneous Potential

AV-F-HW05

MAFB-47

SUMH I AV

Spontaneous Potential Lateral Resistivity Checked By O'Gara/Napp Geophysical Logs Amber Date 8/24/86 Logged By Single Point Resistivity Well Design 1111111111111111 Grout to Surface Depth (ft) -110--120--100-9 -80--50--0/--96--30 Prilling Method Conventional Mud Rotary Graphic Log Project Name Mather Stage III Interbedded medium - to coarse-grained sand and silt Interbedded silty sand and clay; interbeds I to 6 feet thick Small - to medium-sized gravel in a coarse-grained sand matrix €9.7 || || Very fine - to fine-grained sandy clay with minor silt Pea gravel to cobble-sized clasts Small-sized gravel stringer Geologic Description Medium-grained sand Gravel stringer AV-F-HWOS TD 133

Well No. MAFB-49

Drilling Method Conventional Mud Rotary Project Name Mather Stage III

Logged By O'Gara
Checked By Napp

Date 9/14/86

Lateral Resistivity Spontaneous Potential Geophysical Logs Single Point Resistivity Well Design Grout to Surface Depth (ft) -1001--80--130--10--20--50 -09--70--96--30-Graphic Log Brown clay with a few sand  $\overline{\Sigma}$ Snall - to medium-sized gravel in a coarse-grained sand matrix TD 122 Gravel and cobbles in a coarse-grained sand matrix Silty clay with minor fine - to Coarse-grained sand with a few gravels Cemented clay (hardpan) As above with more sand Geologic Description medium-grained sand

AV-F-HW05

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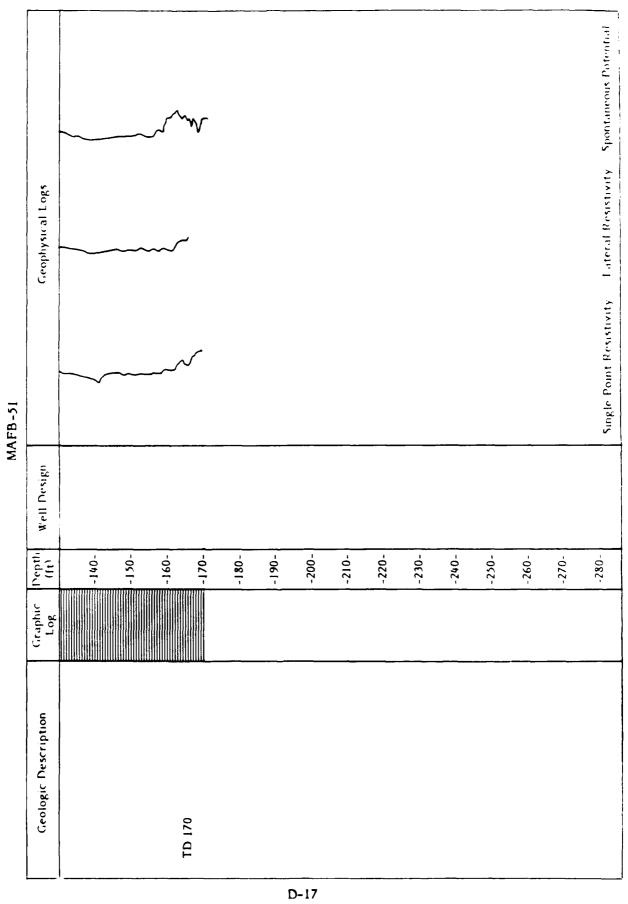
Lateral Resistivity Spontaneous Potential O'Gara/Thurston Geophysical Logs Checked By Napp 9/27/86 Logged By __ Date__ Single Point Resistivity Well No. MAFB-50 Well Design Grout to Surface Depth (ft) -120--130--0-ئ 5 -09 -70--08--100 -20-÷. -04 -96-Drilling Method _Conventional Mud Rotary Graphic Project Name Mather Stage III silty sand
Interbedded silt and grey clay Pea and medium-sized gravel in a medium-grained sand matrix Fine - to medium-grained sand with minor clay interbeds Pea sized gravel, well-rounded Pea gravel in a coarse-grained Fine - to medium-grained Geologic Description sand matrix AV-F-HWOS TD 130

D-15

Well No. MAFB-51

Geologic Description	Graphic Log	Depth (ft)	Well Design	5	Geophysical Logs	
Silty, very fine-grained sand						
Very fine - to medium-grained sand		-10-	<del></del>	<u></u>		
Small gravel < 2cm in a coarse- grained sand matrix		-30-				
Gravel and cobbles		-40-	o Surface	~~	<i>[</i>	
		-09	Grout 1		J	
Medium-grained sand		-70-			\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	
Interbeds, silt sand and clay		-96-				
105.2 \( \sum_{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\tint{\text{\text{\text{\text{\tint{\text{\text{\text{\tint{\text{\text{\text{\text{\text{\tint{\text{\tint{\text{\text{\text{\text{\tint{\text{\text{\text{\text{\text{\text{\text{\text{\tint{\tint{\text{\text{\tint{\text{\tint{\text{\tint{\text{\tint{\text{\tint{\text{\tint{\text{\tint{\text{\text{\tint{\text{\tint{\text{\tint{\text{\tint{\text{\tint{\text{\tint{\text{\tint{\text{\tint{\tinit{\text{\text{\text{\text{\tinit{\text{\text{\tinit{\tinit{\text{\text{\text{\text{\text{\text{\tinit{\text{\text{\tex{\text{\text{\text{\tinit{\text{\tinit{\text{\tinit{\text{\tinit{\text{\tinit{\text{\tinit{\text{\text{\tinit{\text{\tinit{\text{\tinit{\text{\tinit{\text{\tinit{\tinit{\text{\tinit{\tinit{\ti}\tinit{\tinit{\tinit{\text{\tinit{\tert{\tinit{\tinit{\tinit{\tinit{\tinit{\tinit{\tinit{\tinit{\tinit{\tiin}\tinit{\tiint{\tiit{\tiin}\tinit{\tiint{\tiint{\tiint{\tiit{\tiint{\tiint{\tiin}\tiit{\tiit{\tiin{\tiin{\tiitet{\tiinit{\tiin}\tiin{\tiin{\ti	\$2.75.35 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.00.05 \$1.	-100-	11111		\\\	
Primarily brown clay with a few silty interbeds		-120-	<u>                                      </u>	~~	~~	
				Single Point Resistivity	Lateral Resistivity	Spontaneous Potential
AV-F-HW05						

D-16



AV I' HWOS

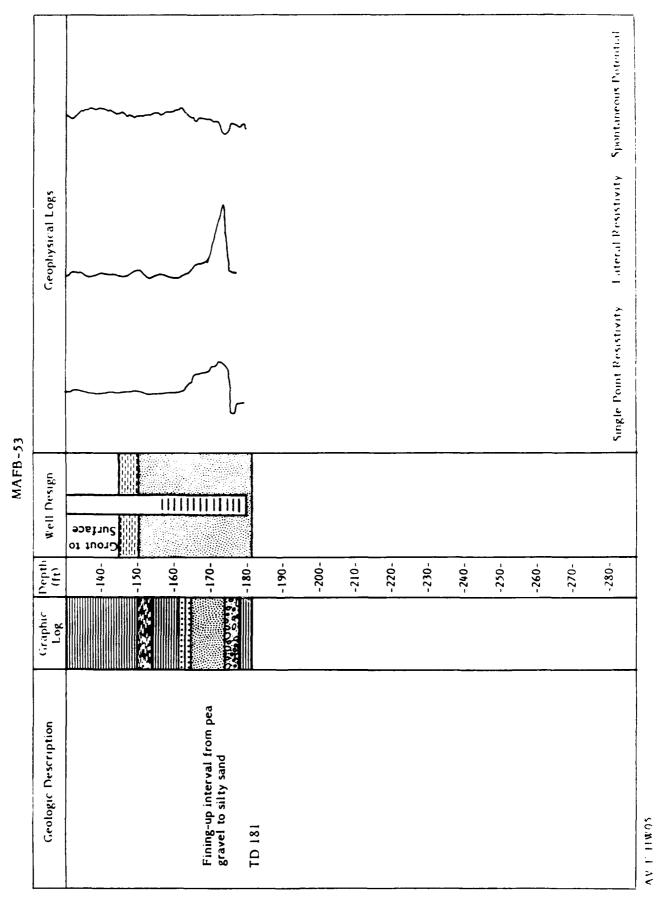
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Well No. MAFB-52

pontaneous Potential ateral Resistivity Geophysical Logs O'Gara Napp 10/1/86 Checked By _ Logged By Single Point Resistivity Nate Well Design Grout to Surface Depth (ft) -100--120--10--20--50--09--20--80--96--130--30--040-Orilling Method Conventional Mud Rotary Graphic Project Name Mather Stage III Interbedded clay, medium-grained sand and silty clay Interbedded pea gravel, medium-grained sand and silty clay 103. 103. Pea and small-sized gravel (< 1cm) in a coarse sand matrix Primarily grey clay with minor very fine-grained sand and silt Primarily clay with minor silt Same as above with less sand and many cobbles Geologic Description Same as above اباد براز MAFB-53 Well No.

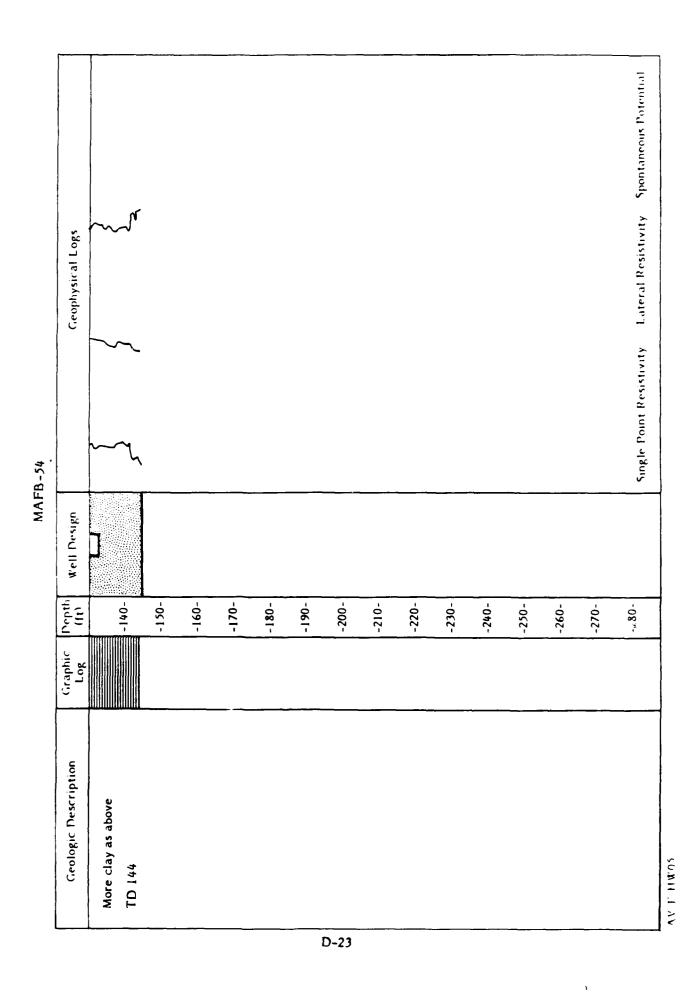
Lateral Resistivity Spontaneous Potential Geophysical Logs O'Gara Napp 98/6/01 Checked By Logged By Single Point Resistivity Date Well Design Grout to Surface Depth (ft) Prilling Method Conventional Mud Rotary -09--100--120--130--10--20--040--70--80--30--50--96-Graphic Log Mather Stage III ij. ₩ Primarily brown clay with a few silty interbeds Interbedded silty clay and very fine - to medium-grained sand Medium to coarse-grained sand Gravel and cobbles, no sand Geologic Description Project Name Gravel in sandy matrix Coarse-grained sand Gravel and cobbles

AV-F-HW05



D-21

Lateral Resistivity Spontaneous Potential Geophysical Logs O'Gara Napp 10/5/86 Checked By _ Logged By _ Date ___ Single Point Resistivity Well Design 1944 1944 14410 Grout to Surface Depth (ft) -100 -10--30--50--09 -07--80--06--20--040-Prilling Method Conventional Mud Rotary Graphic Log Project Name Mather Stage III 102.0 芒文 文章 Primarily brown clay with a few silty interbeds Interbedded fine-grained sand and silt Pea-sized gravel in a coarse-grained sand matrix Interbedded medium-grained sand and silt Geologic Description Very coarse-grained sand Gravel and cobbles Silty stringer



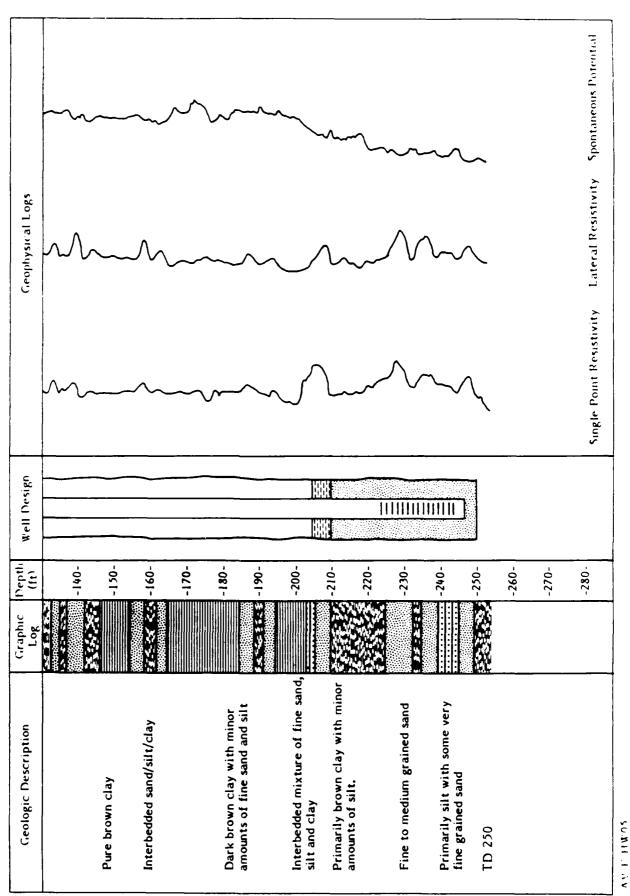
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Mather Stage III

Project Name

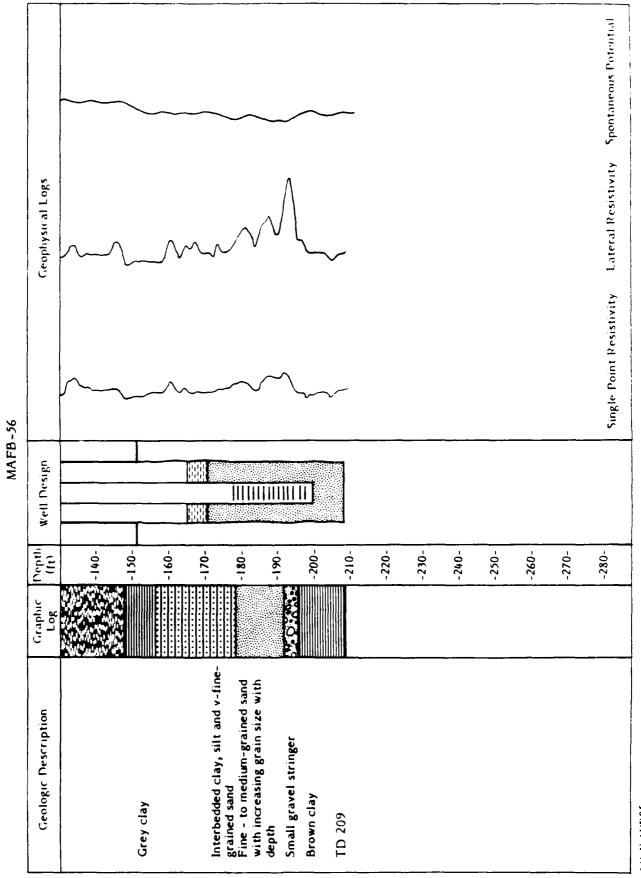
**Spontaneous Potential** Lateral Resistivity Geophysical Logs Date 9/21/86 Single Point Resistivity Well Design Grout to Surface Grout to Surface Depth (ft) -100 -08--130--10-5. -06--20-Drilling Method Conventional Mud Rotary Graphic Log Very fine to medium grained sand Dark brown clay with minor amounts of silt and very fine sand £; ₩ Interbedded buff sandy clay and fine to medium-grained sand Grey and white very fine sandy clay Medium to coarse grained sand and small well rounded gravel Geologic Description Buff, very fine sandy clay Well rounded cobbles Fine - Medium sand AV-F-HWOS



Checked By O'Gara Logged By Napp Nate 9/25/86 Prilling Method Conventional Mud Rotary Project Name Mather Stage III

Geophysical Logs										~		
Well Design											 of the	<u> </u>
=	-10-	-20-	-30-	-040-	-50-	-09-	-20-	-80-	-06-	-00 -00 -011ace	 -120- Grout	-130-
Dept (ft)	7	,								•		
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AV-F-HW05

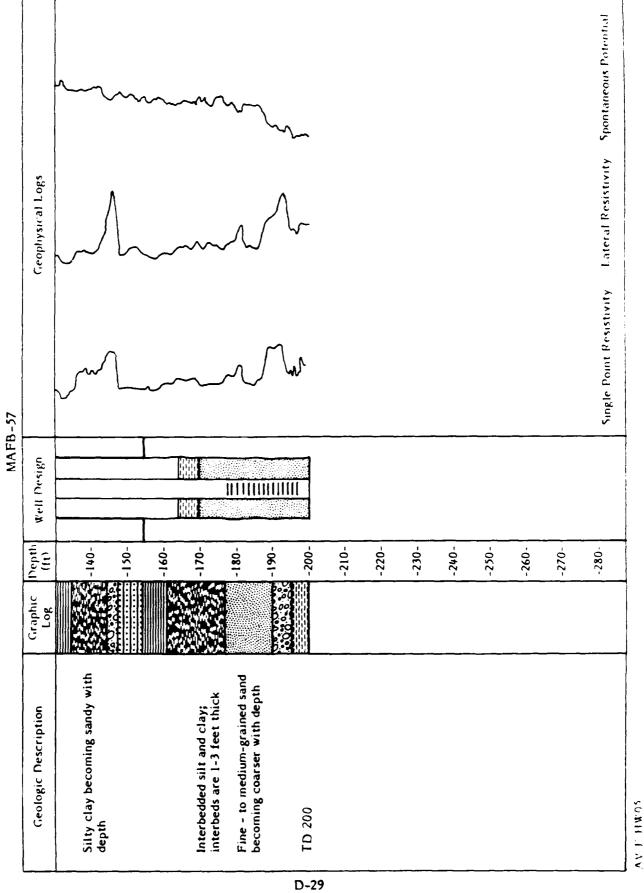


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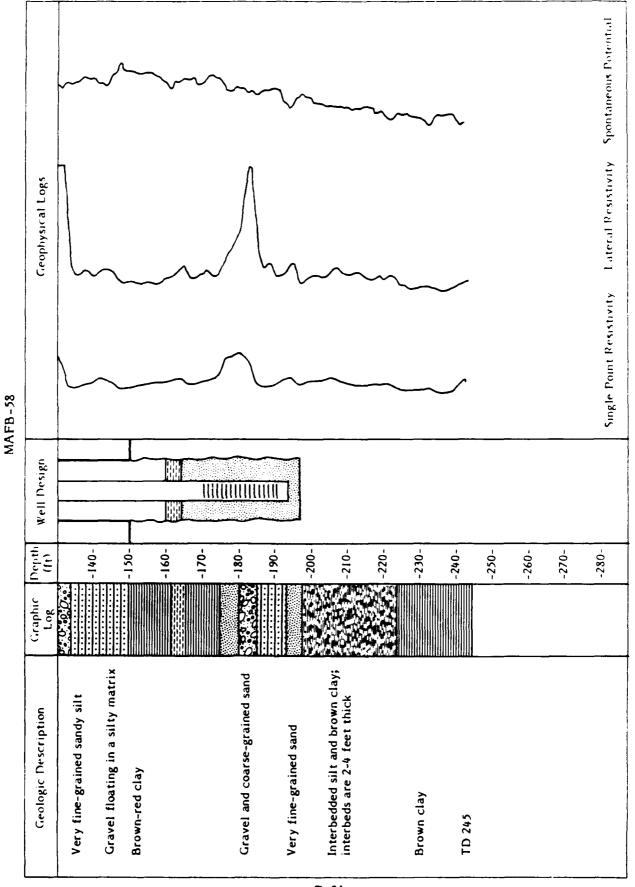
Logged By _

Spontaneous Potential Lateral Resistivity Geophysical Logs Checked By O'Gara 9/23/86 Date Single Point Resistivity Well Design Grout to Surface Grout to Surface Depth (ft) -100-Drilling Method Conventional Myd Rotary -10--50--80--06--110--120--130--20--30-9 -09 -70-Graphic Mather Stage III 78.6 sandy silt with minor amounts of brown clay Pea gravel to cobble sized clasts rounded cobbles to pea gravel in a coarse-grained sand matrix Interbedded silt and brown and Fine - to medium-grained sand Fine - to medium-grained sand Very-fine to fine grained sand Range of grain size from well grey clay; interbeds 1-4 feet thick Small gravel in a coarse sand Very fine - to fine-grained Geologic Description Project Name in a sand matrix Becoming sandy AV-F-HW05 Brown clay matrix



Spontaneous Potential Lateral Resistivity Geophysical Logs Checked By O'Gara Napp 9/23/86 Logged By _ Date __ Single Point Resistivity Well Design Grout to Surface Grout to Surface Depth (ft) -100 -110--30--40--80--06-Prilling Method Conventional Mud Rotary Graphic Log Mather Stage III %0.7 | | | | Well rounded gravel and cobbles Very fine - to fine-grained sand Few pebbles floating in a sandy silt matrix with an increase in gravel content with depth Gravel and cobbles in a coarse-Clast size ranges from coarse-grained sand to cobbles Geologic Description Project Name grained sand matrix AV-F-HW05

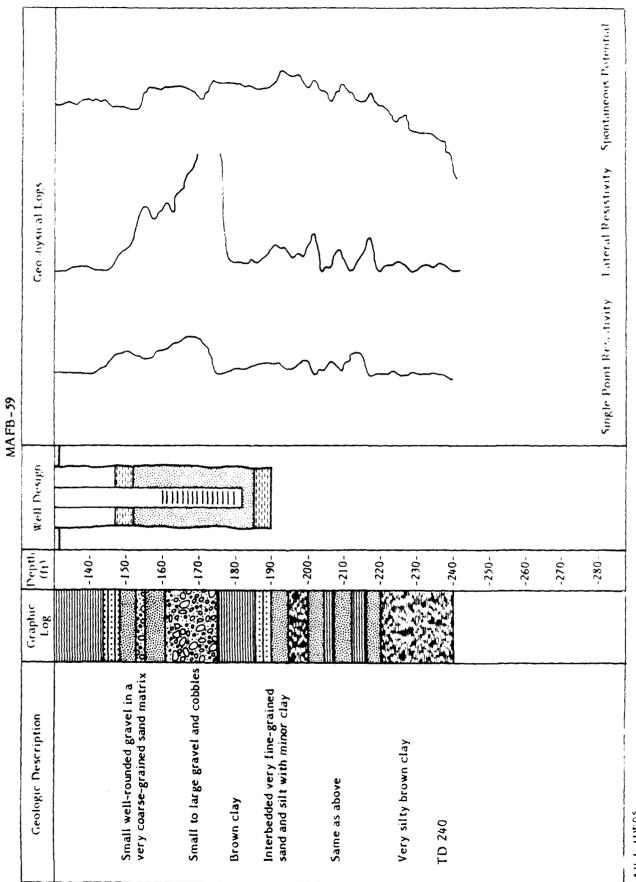
1



AV F HWOS

Lateral Resistivity Spontaneous Potential Geophysical Logs O'Gara Napp 9/23/86 Checked By Logged By Single Point Resistivity Date Well Design Grout to Surface Grout to Surface Depth (ft) -100--10--20--30--09--70--06--110--120--130--40--50--80-Prilling Method Conventional Mud Rotary Graphic Log Mather Stage III ₹<u>7</u>5 Very fine - to fine-grained sand Very fine - to fine-grained sand with silt and minor clay Alternating 2-3 foot thick beds of sand and mixed sand and silt Gravel in coarse-grained sand Gravel in a coarse-grained Interbedded clay, silty clay and medium-grained sand Geologic Description Project Name Medium-grained sand Medium-grained clay sand matrix Brown clay matrix

AV-F-HW05



D-33

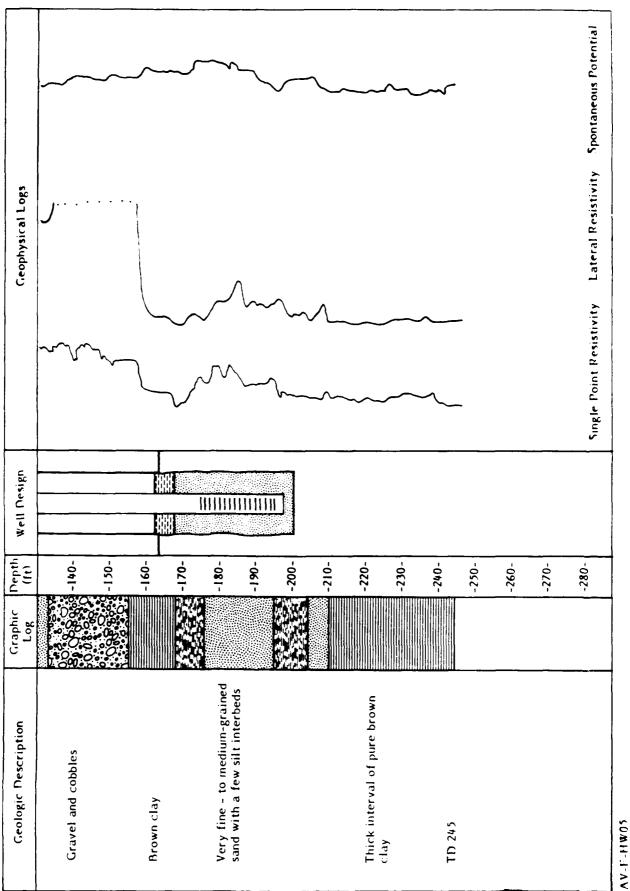
4V 1' HWOS

Logged By O'Gara/Thurston Well No. MAFB-60

Project Name __Mather Stage III

Checked By Napp

(Lateral Resistivity Spontaneous Potential Geophysical Logs Nate 6/26/86 Single Point Resistivity Well Design Grout to Surface Grout to Surface Depth (ft) Prilling Method ___Conventional Mud Rotary -10--130--20--040--09 -0/--100--120--30--5 -0 -80--06-Graphic Log % | | | | | | | Very coarse-grained sand with medium-sized gravel Interbedded sand, clay and silt; interbeds 2-6 feet thick grained sand with minor silt and gravel Very fine-grained sandy silt As above with minor gravel Medium-grained sandy clay Very fine - to very coarse-Medium - to very coarse-grained sand Geologic Description Cobbles 3-4" diameter Brown clay



Project Name Mather Stage III

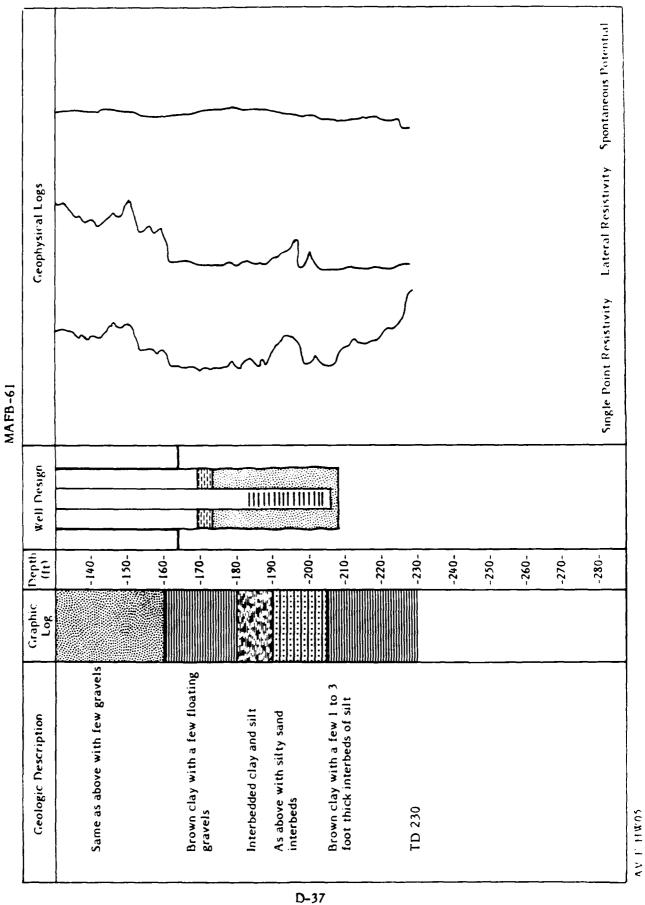
Drilling Method Conventional Mud Rotary

Logged By Napp

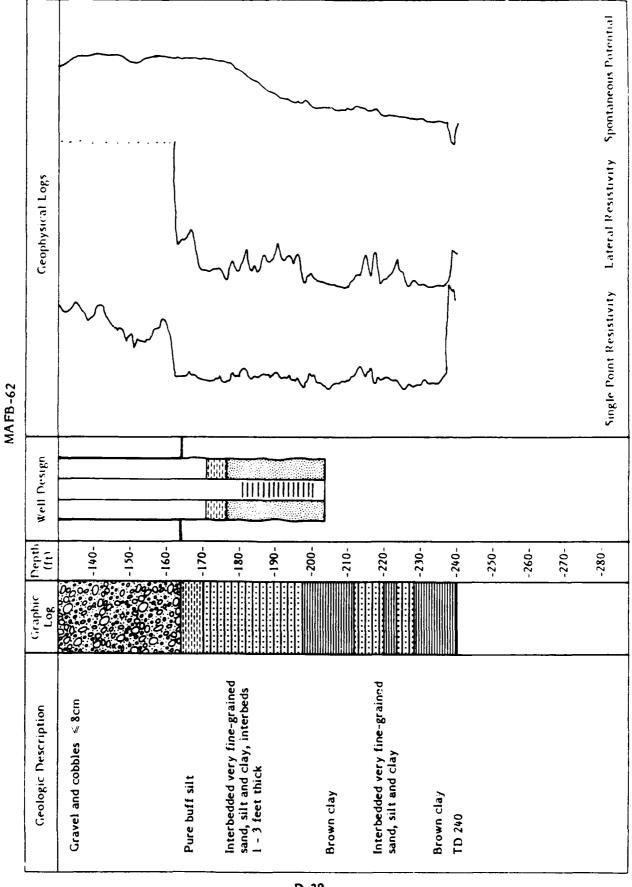
Checked By O'Gara

Date 9/7/86

Spontaneous Potential Lateral Resistivity Geophysical Logs Single Point Resistivity Well Design Grout to Surface Grout to Surface Depth (ft) -110--100--130--09 -120--30-500--80--96--040 Graphic Log with some coarse-grained sand, increasing sand content with 50% medium - to coarse-grained iKJ ĝ Pea to sinall-sized gravel in a Interbedded silt and fine - to inedium-grained sand Small to medium-size gravel medium-grained sand matrix grained sand with a few clay interbeds Primarily fine - to medium-Micaceous medium-grained Silt with minor amounts of As above with more gravel Geologic Description Medium-grained sand sand 50% pea gravel fine-grained sand and less sand **Brown silt** depth sand



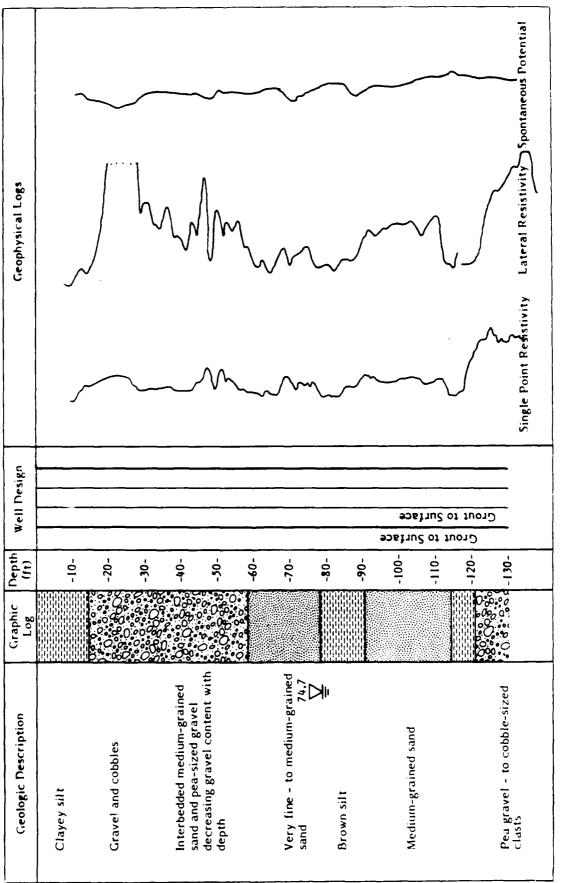
Spontaneous Potential Single Point Resistivity Lateral Resistivity Geophysical Logs O'Gara Napp 98/4/6 Checked By _ Logged By __ Date Well Design Grout to Surface Depth (ft) -100--130--04--5 0,--07--80--30-9 -96-Prilling Method Conventional Mud Rotary Graphic Log Project Name Mather Stage III Medium - to very coarse-grained sand Interbedded sand, silt and clay 83.8  $\frac{83.8}{2}$ Gravel and cobbles < 15cm Gravel and cobbles < 15cm Very fine-grained sandy silt Geologic Description Fine-grained sand; silt

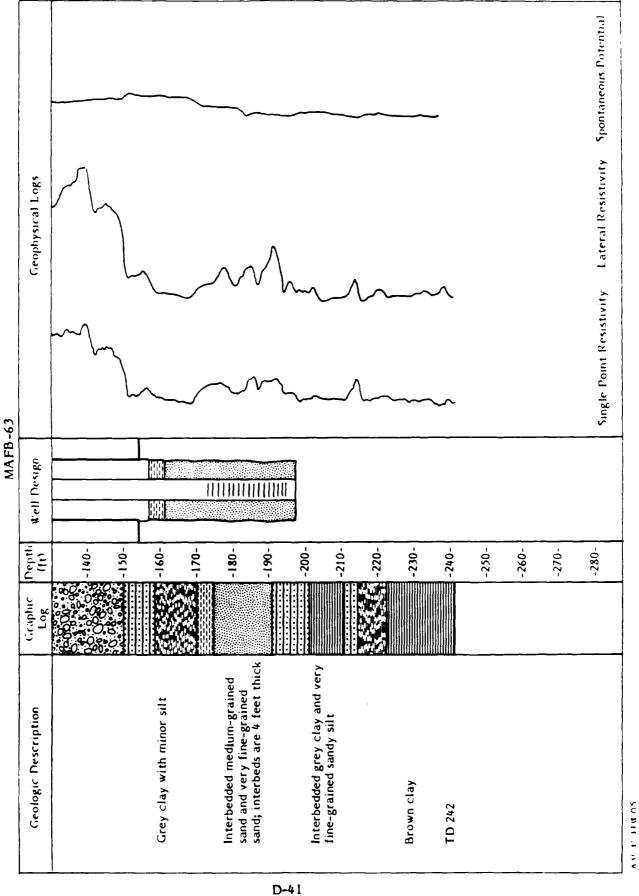


AV I HWOS

Checked By O'Gara/Napp Date 8/25/86 Drilling Method Conventional Mud Rotary Project Name Mather Stage III.

Logged By Amber





Napp O'Gara

Logged By

Spontaneous Potential Lateral Resistivity Geophysical Logs Date 9/12/86 Checked By Single Point Resistivity Well Design Grout to Surface Grout to Surface Depth (ft) -100--09--30--40--20--50--0/--10--96-Drilling Method Conventional Mud Rotary Graphic Log Project Name Mather Stage III Brown clay with varying amounts of silt Small gravel; grain size increases with depth to cobble size clasts medium - to coarse-grained sand Brown clay with yellow streaks Interbedded clay, silt and very fine-grained sand Small to medium gravel in a and varying amounts of silt Geologic Description well rounded cobbles **Brown** clay matrix

Spontaneous Potential Lateral Resistivity Geophysical Logs Single Point Resistivity MAFB-64 Well Design 11111111111111 -140-Pepth (ft) -160--170--190--200--210--220--230--240--280-<u>&</u> ::: -250--760--270-Graphic Log Medium - to coarse-grained sand with minor amounts of small gravel Brown clay with minor amounts of fine - to coarse-grained sand Few gravel floating in a brown stiff silty, sandy clay matrix Interbedded silt, clay and very fine-grained sand Geologic Description Gravel and sand **Brown** clay TD 240

D-43

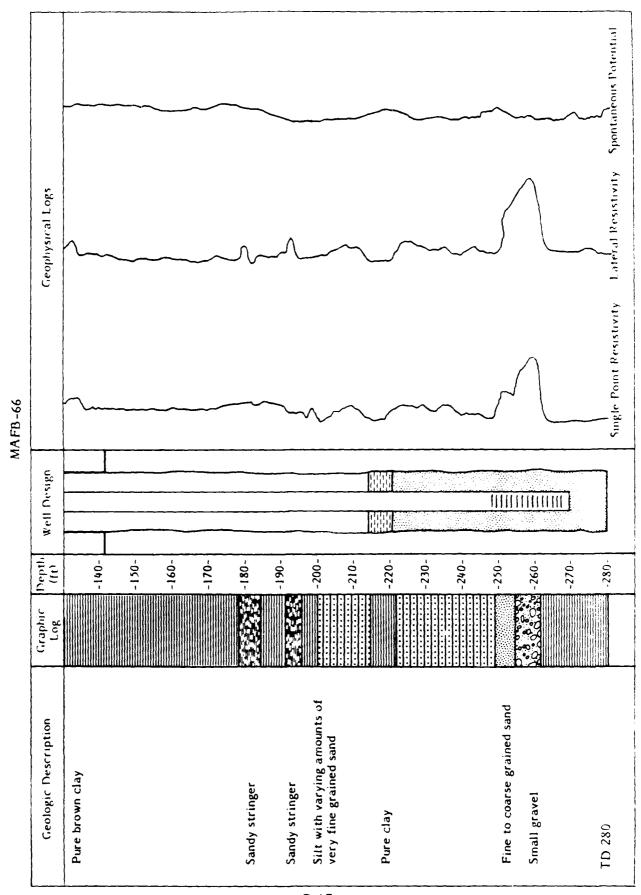
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Spontaneous Potential Lateral Resistivity Geophysical Logs O'Cara Napp 9/12/86 Checked By _ Logged By Date Single Point Resistivity Well Design Grout to Surface Grout to Surface Depth (ft) -100 -120--130-Conventional Mud Rotary -50--30--40--50-9 -80--01--0/-Graphic Log Mather Stage III 104.4 Fine - to coarse-grained sand Brown clay with some medium - to coarse-grained sand stringers Very fine - to medium-grained sand with a few clay interbeds Large gravel and well rounded cobbles Interbedded very fine-grained sand and silt Large gravel and well rounded cobbles Large gravel and well rounded cobbles Fine - to coarse-grained sand with minor clay and silt Geologic Description **Drilling Method** Project Name

MAFB-65

			Spontaneous Potential									
	Geophysical Logs		Lateral Resistivity									
(8-G 1)			Single Point Resistivity									
	Well Design											
	Ռepth (ft)	-140- -150- -150- -170- -170- -220- -220- -220- -230- -250- -250-	-280-									
	Geologic Description	Brown clay with a few stringers of gravel and partially lithified fine - to medium-grained sandstone  Silt with minor amounts of buff clay and fine-grained sand  Silt with small amounts of fine - to medium-grained sand  Sandy clay  Fine - to coarse-grained sand  TD 224										
		D-45										

Spontaneous Potential Lateral Resistivity Geophysical Logs O'Gara Napp 9/18/86 Checked By _ Logged By Date__ Single Point Resistivity Well Design Grout to Surface Grout to Surface Depth (ft) Drilling Method Conventional Mud Rotary -10--50<u>-</u> 9 -80--130--30--04 -70-Graphic Mather Stage III Clay with fine to medium-grained sand and minor small gravel Well rounded gravel and cobbles in a fine to coarse grained sand \$3° Clean fine-coarse grained sand Well rounded small to medium Brown clay with some fine to inedium grained sand gravel in a very coarse sand matrix Geologic Description Project Name Silty sand Silty sand matrix



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Geophysical Logs Checked By O'Gara Napp 10/1/86 Logged By __ Date Well Design Grout to Surface Grout to Surface Depth (ft) -1001--10--20--040--09--07--80--06--30--50-Orilling Method Conventional Mud Rotary Graphic Log Project Name Mather Stage III Pea and small-sized gravel < 3cm in a coarse-grained sand matrix Medium - to coarse-grained sand Gravel and cobbles ( < 20cm) with varying amounts of coarsegrained sand Interbedded fine-grained sand and silt with minor clay Geologic Description occuring at 90'

Lateral Resistivity Spontaneous Potential

Single Point Resistivity

-110-

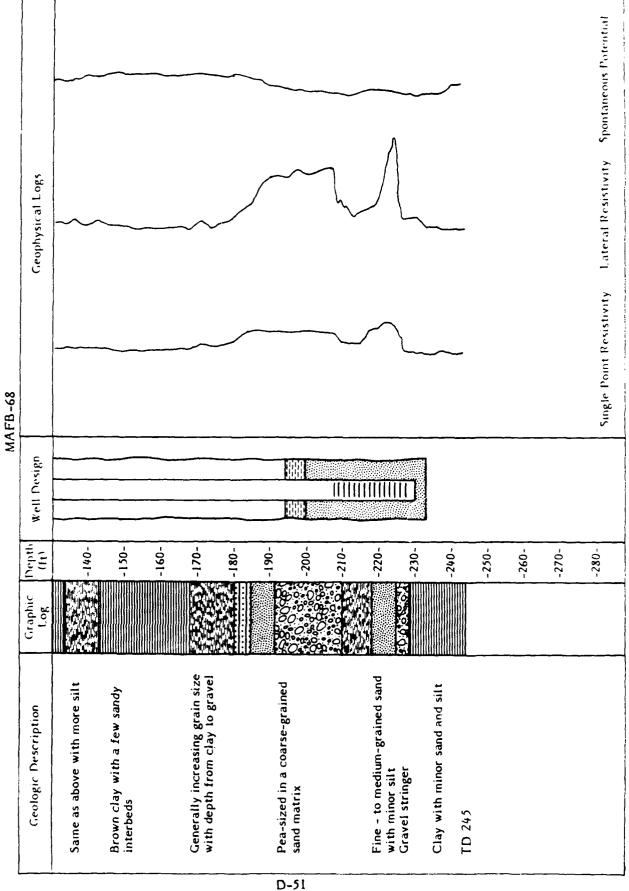
-120-

Micaceous, brown, soft and wet clay

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MAFB-68

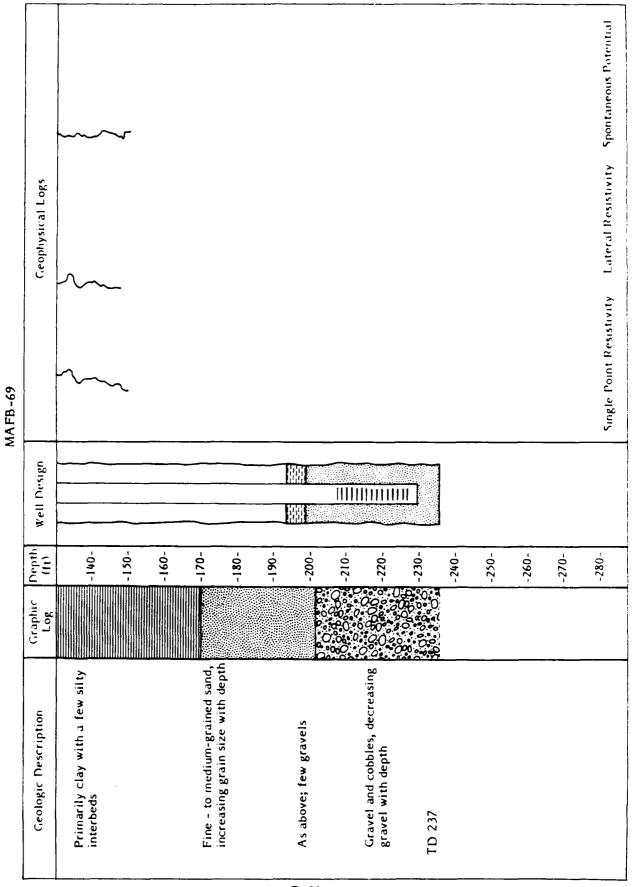
Lateral Resistivity Spontaneous Potential Geophysical Logs O'Gara Napp 9/22/86 Checked By _ Logged By Date__ Single Point Resistivity Well No. Well Design Grout to Surface Grout to Surface Depth (ft) -100--130--120--20--040--96--110-<u>-</u>0--70--30-Drilling Method Conventional Mud Rotary Graphic Project Name Mather Stage III Pea gravel and small-sized gravel ( < 1cm) in a sandy matrix Grey clay with a few silty zones 112.5 Very fine-grained sandy silt Very fine-grained sandy silt Small-sized gravel (< 1cm) with some medium-grained Brown clay with a few silty interbeds Well rounded cobbles (4-6" diameter) Very coarse-grained sand Geologic Description sand



AV FHW05

Checked By O'Gara Napp 10/5/86 Logged By __ Date Well No. MAFB-69 Prilling Method Conventional Mud Rotary Project Name Mather Stage III

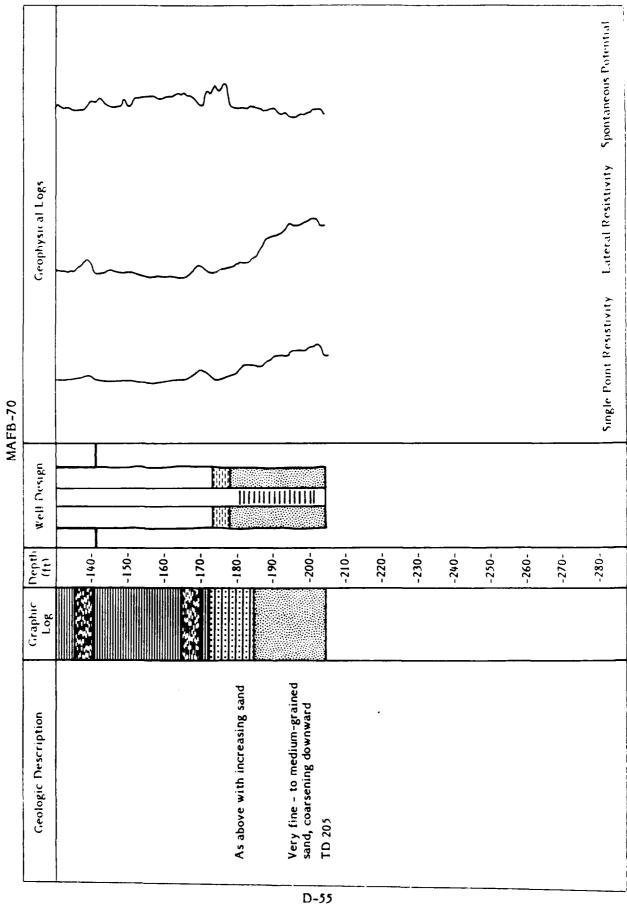
Geophysical Logs			· · · · · · · · · · · · · · · · · · ·	~~		····		<b>^</b>	\ \ -	~~	~~	Single Point Resistivity Lateral Resistivity Spontaneous Potential
Well Design									Surta		Crout	] - -
Depth (ft)	-10-	-20-	-040-	-50-	-09-	-70-	-80-	-06-	-1001-	-110-		-081-
Graphic Log			20 - 0 0 - 0 0 - 0 0 - 0	$\sim 0$	000 sl 000 s 000 s 000 s 000 s 000 s		000 000 000 000 000					
Geologic Description			Well rounded gravel and large cobbies					Medium - to coarse-grained sand with minor gravel	0.611	Ď÷		



AV I' HWOS

O'Gara Napp 10/2/86 Checked By Logged By ___ Date____ Well No. MAFB-70 Prilling Method Conventional Mud Rotary Project Name Mather Stage III

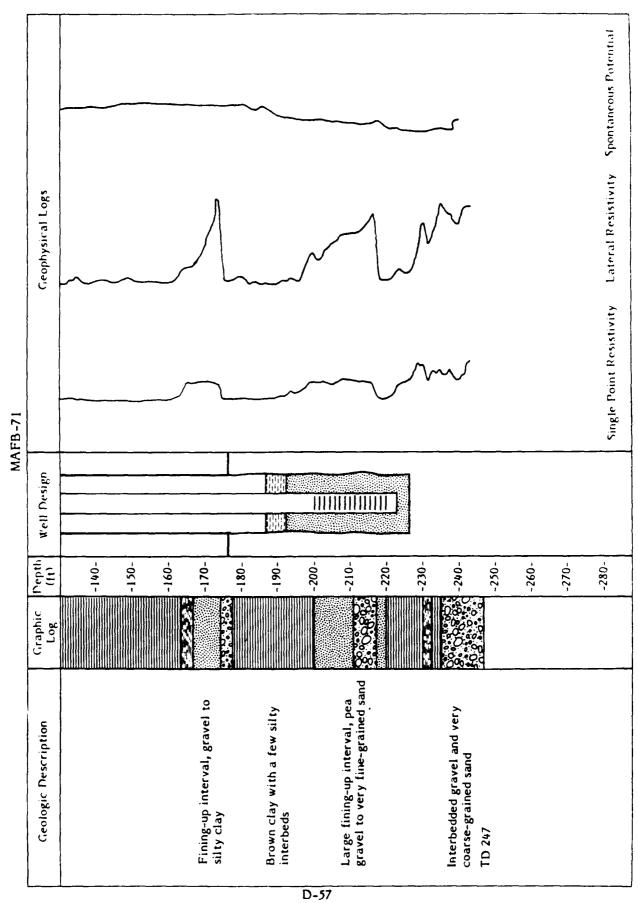
Geophysical Logs		~~ ~~	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\		Single Point Resistivity Lateral Resistivity Spontaneous Potential
Well Design				Surface urface	of tuonD
Depth (ft)	-10-	-30-	-5060-	-80- -90- -100-	-120-
Graphic Log	La de la marchia			್ಷ ನಿರ್ವಹಿಸಿ	
Geologic Pescription	Pea - to small-sized gravel ≤2cn	Interbedded medium-grained sand and sandy silt	Primarily grey clay with minor very fine-grained sand and silt	Fining-up interval from gravel thru silty sand $104.5$	Primarily brown clay occasionally interrupted by zones approximately 2-3 feet thick



AV I' HWOS

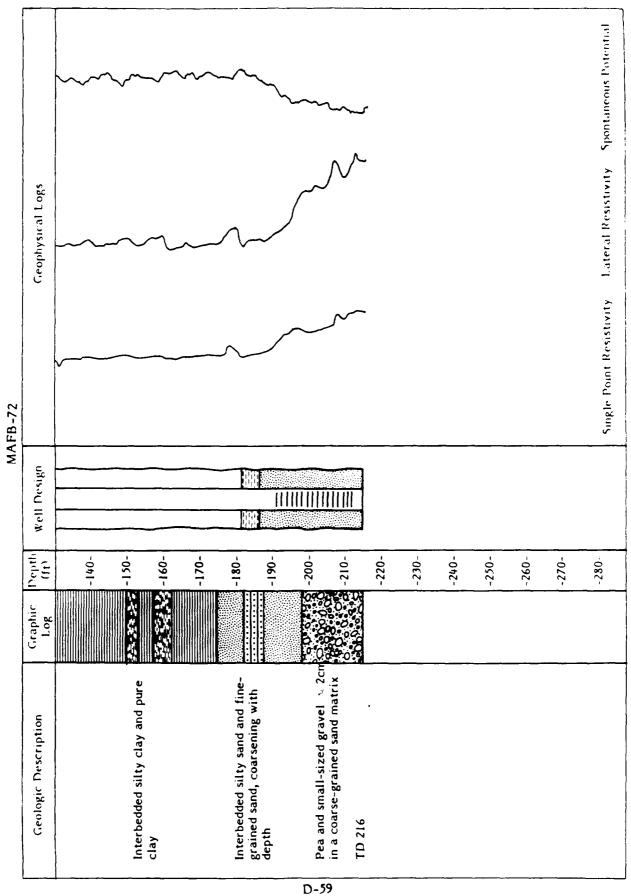
Well No. MAFB-71

Spontaneous Potential Lateral Resistivity Geophysical Logs O'Gara Napp 10/6/86 Checked By Logged By _ Single Point Resistivity Date Well Design Grout to Surface Grout to Surface Depth (ft) -100--011--10--09--20--30--50--70--80--120--130-Prilling Method Conventional Mud Rotary Graphic Mather Stage III Fining-up sand interval, very 115. coarse to fine-grained Medium - to coarse-grained sand Well rounded gravel and cobbles Thin coarse-grained sand bed Primarily brown clay with occasional silty and sandy interbeds Geologic Description Project Name Silty brown clay



SUMH HAV

Lateral Resistivity Spontaneous Potential Geophysical Logs Napp 10/9/86 Logged By _ Checked By Date__ Single Point Resistivity Well Design Grout to Surface Grout to Surface Depth (ft) -120--110-500 9 -130--20--04--10 -30--70--08--96--100-Drilling Method . Conventional Mud Botary Graphic Mather Stage III 102.4 Coarse - to very coarse-grained sand Very fine - to medium-grained sand Fine - to very coarse-grained sand becoming coarser with depth Gravel and cobbles <11cm Geologic Description Interbedded silt and clay Project Name Gravel and cobbles Brown clay AV-F-HW05



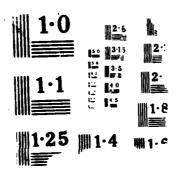
AV I' HWOS

Lateral Resistivity Spontaneous Potential Geophysical Logs Thurston Napp 9/29/86 Checked By __ Logged By Date_ Single Point Resistivity Well No. MAFB-73 Well Design 11111111111111111 Grout to Surface Depth (ft) -100 -120--10--50-9 -110--130--20--80--96--30--04 -0/-Orilling Method Conventional Mud Rotary Graphic Log Project Name ___ Mather Stage III Small to medium-sized gravel in a coarse-grained sand matrix ĕ. ₩ Pea and small-sized gravel in a coarse-grained sand matrix Fine - to medium-grained sand with minor silt Interbedded very-fine grained Geologic Description Gravel and cobbles Gravel and cobbles sand, clay and silt TD 135 Brown clay

D-60

Lateral Resistivity Spontaneous Potential Geophysical Logs O'Gara Checked By Napp 9/30/86 Logged By _ Single Point Resistivity Date Well No. MAEB-75 Well Design Grout to Surface -120-130--110--80-Depth (ft) -50--09--70--96--040--10--20--30-Prilling Method Conventional Mud Rotary Graphic Log Mather Stage III % ∑! Interbedded very coarse-grained Primarily fine - to coarse-grained sand with a few silt interbeds strained and cobbles in a coarse-Gravel and cobbles in a coarse-grained sand matrix Very fine - to medium-grained sand Geologic Description Project Name ar uned sand matrix sand and bea gravel Reddish clay

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Logged By

Single Point Resistivity Lateral Resistivity Spontaneous Potential Geophysical Logs O'Gara 10/10/86 Checked By __ Date Well Design Grout to Surface Depth (ft) -120--130--1001--09--01--20--60 -50--0/--96--30-Drilling Method Conventional Mud Rotary Graphic Log Project Name Mather Stage III Very coarse-grained sand with a few pebbles ₩ ₩ Interbedded very fine-grained sand and silt Gravel and cobbles in a sand matrix - becoming sand poor with depth Very large gravel and large cobbles with a few coarse-grained sand interbeds Very coarse-grained sand Geologic Description Very fine-grained sand Brown clay TD 121

TABLE D-1. Well depths and screened intervals.

## Shallow Wells

Well No.	Site	Total Depth in Ft. Below Ground Surface	Screened Interval (Ft. Below Ground Surface)
40	7100	124	92-112
41	7100	150	100-120
42	7100	133	90-110
43	7100	133	108-128
44	7100	110	60-80
45	7100	105	55-75
46	Jet Test Cell	116	70-90
50	ACW	130	100-120
51	ACW	170	105-125
52	ACW	140	105-125
53	ACW	181	157-177
54	ACW	144	110-130
47	West Ditch	108	75-95
48	West Ditch	133	70-90
49	(West Ditch) Commissary	122	99-119
73	NE Perimeter	135	112-132
75	NE Perimeter	114	91-111
76	NE Perimeter	121	87-107

TABLE D-1. (con't)

Deep Wells

Well No.	Site	Total Depth (ft)	Screened Interval (ft)	Depth to Bottom of Conductor (ft)	Depth to Bottoin of Surface Casing (ft)
55	7100	250	225-245	126	
95	7100	209	177-197	152	55
57	7100	200	177-197	156	55
58	7100	245	171-191	150	55
59	Jet Test Cell	240	160-180	131	55
29	ACW	213	190-210	117	ŀ
89	ACW	245	207-227	110	;
69	ACW	237	207-227	130	·
70	ACW	205	183-203	142	;
71	ACW	247	200-220	177	l
72	ACW	216	192-212	130	1
09	West Ditch	245	175-195	164	55
19	West Ditch	230	184-204	165	1
62	West Ditch	240	181-201	165	1
63	West Ditch	242	175-195	155	1
99	NE Perimeter	280	247-267	142	1
65	NE Perimeter	224	195-215	115	ł
<b>79</b>	NE Perimeter	240	175-195	115	1

APPENDIX E

**Laboratory Procedures** 

#### E. LABORATORY CONSIDERATIONS

#### **E.1** Laboratory Procedures

AeroVironment will send the original samples collected to Acurex Laboratory in Mountain View, California, for analysis. The AV field team will also send 10% of the splits collected in the field to USAFOEHL at Brooks AFB, Texas.

Acurex will be responsible for checking sample condition upon receipt, analyzing the samples, tracking them while in their possession, and reporting the results to AV. The following analyses will be performed on the Mather AFB samples:

VOC - Water (601/8020)
Petroleum Hydrocarbons - Water (3550/418.1)
Total Phenolics - Water (420.1)
Common Anions - Water (SM 429)
Metals and Minerals - Water (200.7)
Arsenic - Water (206.2)
Mercury - Water (245.1)
Selenium - Water (270.2)
TDS - Water (160.1)
Alkalinity - Water (SM 403)
Cyanide - Water (EPA 335.2)

The methods planned for these analyses are briefly outlined on Table E-1. Table E-2 shows detection limits, holding times and sample volume requirements.

Acurex is currently certified by the California Department of Health Services to conduct all of the analyses that the certification program covers. All work completed on the Mather AFB samples will be in accordance with applicable state certification procedures.

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# TABLE E-1. Analytical method description.

Volatile Organics ⁽²⁾	-	Methods 601 and 8020. Will determine those compounds listed in the specific methods. Acurex will extract the samples by Purge and Trap for each analysis, and use a GC-Hall and GC-PID for Methods 601 and 8020, respectively.
Heavy Metals (2) and Minerals (2)		Series 200 methods. EPA-600/4-79-020. Acurex will determine Ba, Cd, Ca, Cr, Fe, Pb, Mn, Mg, K, Ag, Na. All analyses will by inductively coupled plasma emission spectroscopy.
Petroleum Hydrocarbons ⁽²⁾	-	EPA Method 418.1. Similar to oil and grease analysis, but involves a step to remove animal and vegetable-derived oils and fats. Only petroleum mineral oil and greases are quantitated, by infrared spectrophotometry. Soil samples will be extracted prior to analysis using Method 3550.
Alkalinity ⁽⁴⁾		Includes carbonate, bicarbonate and hydroxide alkalinity and total hardness. Analysis will be by titration.
Total Phenolics ⁽²⁾	-	EPA Method 420.1. Will determine total phenolic content; method does not differentiate between different substituted phenols. Phenols are reacted with a color-forming agent and quantitated colorimetrically.
Common Anions ⁽⁴⁾	-	Includes chloride, sulfate, nitrate bromide, fluoride nitrite and phosphate. Analysis will be by ion chromatography.
Total Dissolved Solids	-	Method 160.1. The laboratory will gravimetrically analyze all residue which passes through the filters.
Arsenic ⁽²⁾	-	Method 206.2. Analysis will be done by graphite furnace atomic absorption.
Mercury ⁽²⁾	-	Method 245.1. Analysis will be done by cold vapor atomic absorption.

#### TABLE E-1. continued.

Selenium - Method 270.2. Analysis will be done by graphite furnace atomic absorption.

Cyanide⁽²⁾
- Method 335.2. Analysis will be done by UV visible spectroscopy.

- (2) Methods for Chemical Analysis of Water and Wastes, U.S. EPA, Environmental Monitoring and Support Laboratory, Cincinnati OH 45268, EPA 600/4-79-020.
- (3) Test Methods for Evaluating Solid Waste, U.S. EPA, Office of Solid Waste Management and Emergency Responses, Washington, DC 20460, July 1982, 2nd Edition.
- (4) Standard Methods for the Examination of Water and Wastewater, American Public Health Association, 1015 Fifteenth Street NW., Washington, DC 20005, 16th Edition.

⁽¹⁾ Methods for Organic Chemical Analysis of Municipal and Industrial Water, U.S. EPA, Federal Register Vol. 29, 26 October 1984.

TABLE E-2. Analytical summary.

Parameter	Method	Description	Method Detection Limit (MDL)	Maximum Holding Time	Preservation	Sample Container	2nd Column Confirmation
Volatile Organics	EPA 601	Purgeable Halocarbons by Hall/GC	As specified in methods	14 days	Cool to 4°C	40 ml glass	Analyte > MDL
	EPA 8020	Aromatic volatile organics by PID/GC		7 days	Cool to 4°C	40 ml glass	Analyte > MDL
Petroleum Hydrocarbons	EPA 3550 EPA 418.1	Total petroleum hydro- carbon compounds IR method	1 mg/L	28 days	H ₂ SO ₄ to pH < 2 Cool to 4°C	1 L glass	
Total Phenolics	EPA 420.1	Total phenolic compound content, colorimetric method	5 µg/L	28 days	H ₂ SO ₄ to pH < 2 C601 to 4°C	1 L glass	
Common Anions	SM 429	F ⁻ , Cl ⁻ , NO ² ⁻ , PO ³ ⁻ , Br ⁻ , NO ² ⁻ , SO ² ⁻ by ion chromatography	As specified in method	CI, F, Br, SO ₄ : 28 days, NO ₂ , NO ₃ , PO ₄ : 48 hrs	Cool to 4°C	I L HDPE	
Metals & Minerals	EPA 200.7	Ba, Cd, Ca, Cr, Fe, Pb, Mg, Mn, Ag, Na, K by ICP	See Appendix A Page 20	6 months	HNO ₃ to pH < 2 Cool to 4 C	1 L норе	
Arsenic	EPA 206.2	As by graphite furnace AAS	0.001 mg/L	6 months	HNO, to pH < 2 Cool to 4°C	1 L HDPE (with Hg, Se)	
Mercury	EPA 245.1	Hg by cold vapor AAS	0.0002 mg/L	28 days	HNO ₃ to pH < 2 Cool to 4 C	1 L HDPE (with As, Se)	
Selenium	EPA 270.2	Se by graphite furnace AAS	0.002 mg/L	6 months	HNO, to pH < 2 Cool to 4 C	1 L HDPE (with As, Hg)	
TDS	EPA 160.1	Total filterable	16 mg/L	48 hours	Cool to 4°C	1 L HDPE residue by gravimetry	e by gravimetry
Alkalinity	SM 403	Carbonate, bicarbonate and hydroxide alkalinity	۷/۷	14 days	Cool to 4°C	I L HDPE (with TDS)	
Cyanide	EPA 335.2	CN ⁻ analysis by UV visible spectroscopy	.01 mg/L	30 days	NaOH to pH > 12 Cool to 4 C	і L норе	
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QUALITY ASSURANCE PLAN

FOR

ANALYSIS OF MATHER AIR FORCE BASE SAMPLES

For

AeroVironment, Inc. 825 Myrtle Avenue Monrovia, California 91016

Ву

Acurex Corporation
Environmental Systems Division
485 Clyde Avenue
P. 0. Box 7044
Mountain View, California 94039

Section No. 1 Revision No. 0 Date: October 6, 1986 Page 1 of 1

#### 1. INTRODUCTION

The purpose of this Quality Assurance Plan is to describe the procedures that are used to assure the quality of organic and inorganic analyses of water and soil samples collected by AeroVironment at Mather Air Force Base.

ection No. 2.1 kevision No. 1

Date: December 8, 1986

Page 1 of 1

#### QUALITY ASSURANCE PLAN

FOR

ANALYSIS OF MATHER AIR FORCE BASE SAMPLES

Approved by:

Acurex Corporation Project Manager

Acurex Corporation Environmental Systems Division Quality Assurance Manager

AeroVironment, Inc. Project Manager

AeroVironment, Inc. Quality Assurance Manager

David R. Taylor,

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	2.2	Table of Contents	2	1	12/08/85
	2.3	Project Description	1	0	10/06/36
	2.4	Project Organization and Responsibility	2	1	12/08/86
	2.5	QA Objectives for Measurement Data	2	0	10/06/86
	2.5	Sampling Procedures	2	0	10/06/36
	2.7	Sample Custody	1	1	12/08/36
	2.8	Calibration Procedures and Frequency	2	1	12/08/35
	2.9	Analytical Procedures	2	0	10/05/36
	2.10	Data Reduction, Validation, and Reporting	3	1	12/08/35
	2.11	Internal Quality Control Checks and Frequency	5	0	10/05/85
	2.12	Performance and System Audits and Frequency	1	1	12/08/35
	2.13	Preventive Maintenance Procedures and Schedules	1	0	10/06/36
	2.14	Routine Procedures to Assess Data Precision Accuracy and Completeness of Specific Measurement Parameters Involved	2	0	10/06/86
	2.15	Corrective Action	1	0	10/06/86
	2.16	Quality Assurance Reports to Management	1	0	10/06/86
	Appen	dix A - Standard Operating Procedures	15	0	12/08/86

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Personnel Receiving Copies of Approved Quality Assurance Plan

Project Responsibility	Name
Project Manager	Jan Ehmann
ESD QA Manager	David R. Taylor
Project Chemist	Greg Nicoll
Sample Control Custodian	Efren Sablan
Metal Analyses	Patrick M. Hirata
General Analyses	J. Romeo Milanes
GC Analyses	Sarah Schoen
GC/MS Analyses	Richard Scott
AeroVironment Project Manager	Douglas B. Taylor
AeroVironment QA Manager	Keith J. Pettus
AeroVironment Project Chemist	Chris Lovdahl

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### 2.3 Project Description

The purpose of this project is to provide quantitative organic and inorganic analyses of water and soil samples collected by AeroVironment at Mather Air Force Base. Volatile organics, pesticides, metals, anions, and other parameters will be measured. Gas chromatography will be employed for pesticides and volatile organic determinations. Gas chromatography/mass spectroscopy may be employed for confirmation of gas chromatographic analyses. Metals will be determined by inductively-coupled argon plasma emission spectrometry and atomic absorption spectrometry. Ion chromatography will be used for anion analyses.

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### 2.4 Project Organization and Responsibility

The Project Manager is Dr. Jan Ehmann, who will manage the Acurex team and interface with the AeroVironment project manager. The QA Manager for this project is Dr. David Taylor, who will approve procedures and review quality assurance data. The project chemist is Greg Nicoll, who has the overall technical responsibility. In addition, Mr. Nicoll will coordinate shipment and analysis schedules with AeroVironment field and technical personnel. The sample custodian, who is responsible for receipt and custody of all samples, is Efren Sablan. Mary Colburn will be responsible for all inductively coupled argon plasma spectrometric analyses. Patrick Hirata will be responsible for all atomic absorption analyses. J. Romeo Milanes will be responsible for all general chemical analyses excluding atomic absorption spectrophotometry. Jr. Sarah Schoen will be responsible for all gas chromatographic analyses. Richard Scott will be responsible for all mass spectrometric analyses.

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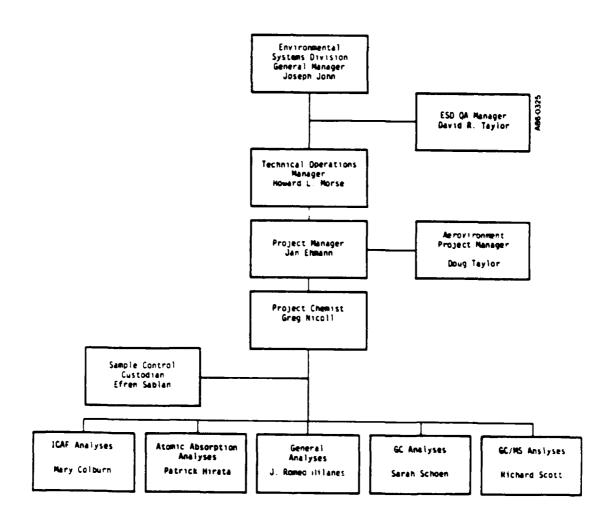


Figure 2.4-1. Project Organization

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# 2.5 QA Objectives for Measurement Data in Terms of Precision, Accuracy, Completeness, Representativeness, and Comparability

QA objectives for precision, accuracy, and completeness are presented in Table 2.5.1. Method precision for each method will be determined from duplicate analyses. At least one sample in twenty will be analyzed in duplicate. Accuracy will be determined from spiked sample analyses. At least one sample in twenty will be spiked and the accuracy as percent recovery measured. Sample duplicate and spike analyses will be assigned by the sample custodian who will keep a running total of analyses required by each method.

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Table 2.5.1 Summary of QA Objectives

		Groundwater			So 1 1	
Parameter	Precision, %	Accuracy, \$	Completeness	Precision, %	Accuracy, %	Completeness
Volatile Organics	<15	60 to 145	>90	<15	60 to 140	>90
PCB's		••		<40	25 to 140	>90
Metals	<30	70 to 130	>90	<40	65 to 135	>90
Petroleum Hydrocarbons	<15	80 to 115	>90		••	
Percent Moisture		••		<20		>90
TDS	<25	••	>90	••		••
Antons	<20	75 to 125	>90	••	••	
Alkalinity	<15	90 to 120	>90			
Phenol	<20	80 to 120	>90	••		

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## 2.6 Sampling Procedures

Sampling will be performed by AeroVironment. No bottles will be provided by Acurex. Sample holding times per analysis are shown in Table 2.6.1.

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Analysis	Method Holding Time from Sampling
8010	14 days
8020	14 days
601	14 days
602	7 days (14 days if acidified)
200.7	6 months
418.1	28 days
8080	30 days (7 days for extraction)
160.1	Start analysis within 48 hours
SM249	2 days
D2216-71	Not specified in method
420.1	28 days
SM403	14 days
206.2	6 months
245.1	28 days
270.2	6 months
1010	14 days
1310	21 days

Table 2.6.1. Holding Times for Samples

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#### 2.7 Sample Custody

The sample custodian will verify the arrival of all samples against the AeroVironment Sample Submittal Form/Chain of Custody Record. Any discrepancies in the Samples and the SSF/COC Record will cause the sample custodian to immediately notify the AeroVironment Project Chemist.

Each sample or group of samples shipped to Acurex for analysis will be given an Acurex identification number. The Sample Custodian will record the client name, number of samples, and date in the Sample Control Log Book. The identification number will appear on a traveler (sample attached) that will be released when the samples are logged in. This traveler will identify the type of analyses requested for the samples and their holding times. When all analyses are completed, all sample extracts will be gathered and stored. Samples are disposed of after the holding times have expired, unless the sample has been marked "Hold" by AeroVironment. "Hold" samples will be disposed of with permission of the AeroVironment Project Manager.

All data, reports, and documents pertaining to samples are stored by the Sample Custodian either at Acurex or off-site.

More detailed descriptions of sample custody are found in Standard Operating Procedures: OP-SCC 3, Sample Custodian Duties; OP-DIV 1, Chain of Custody; OP-DIV 5, Sample Tracking on IFBs; OP-DIV 3, Security of Laboratory; and OP-SCC 1, Receipt and Opening of Samples.

—			
Dept: GEN AA EX	IT MS GC SC	Writer:	Lab :0#
Client		<b>4 1</b>	Location
Address			Special Instruction:
		Date Rec'd	
Attn:	Phone	Date Issued	
No. of Samples	Flammable	By1	
Type S/W	Corrosive	Due: Ext	
Return/Hold 1 Mo	Reactive	VOA	
	Toxic	Report	
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#### 2.8 <u>Calibration Procedures and Frequency</u>

Calibration of the GC/MS system will be performed daily at the beginning of the day or with each 10 to 12 hours of instrument operating time. This will consist of mass calibration with FC-43, ion abundance calibration with decafluorotriphenylphosphine or bromofluorobenzene, and verification of response factors for each of the test compounds using standards of known concentrations. Decafluorotriphenyl phosphine (DFTPP) will be used to verify the ion abundance calibration for the GC/MS analysis of semivolatile organics, while bromofluorobenzene (BFB) will be used to verify the ion abundance calibration for the GC/MS analysis of volatile organics. Response factors will be determined daily and will be compared with the average values from a five-level calibration performed at the beginning of the project or following major instrument repair. When any one of fifteen calibration check compound response factors is outside of  $\pm 25$  percent of the five-level calibration response factors, the instrument will be adjusted and the calibration check will be repeated until all fifteen calibration check compound response factors fall within 15 percent of the five-level calibration response factors or a new five-level calibration will be made.

Quantitation of samples that are analyzed by GC/MS will be performed by internal standard calibration. The internal standards that will be used are described in Section 2.11.1.

Quantitation of samples that are analyzed by GC will be performed by external standard calibration. Standards containing the compounds listed in each method will be analyzed at various concentrations (minimum three levels) to establish the linear range of the detector. Following multilevel calibration, analysis of samples will be initiated. Single point calibration will be performed at the beginning of each day and at every tenth injection.

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The response factors from the single point calibration will be checked against the average response factors from multilevel calibration. If a deviation greater than 35 percent occurs then system recalibration will be performed. Alternatively, fresh calibration standards will be prepared and analyzed to verify instrument calibration.

Calibration for metals analyses will be performed at the beginning of each elemental analysis. After the instrument parameters are set, a multi-level (3-5 point) calibration will be performed. Instrument sensitivity will be determined. If the sensitivity is not comparable to the manufacturer's specifications, the instrument will be reset until it meets specifications. After every ten samples, a check standard will be run to verify that the calibration has not changed by more than 10%. A value outside of this range will require that the instrument be recalibrated and the last ten samples rerun. To determine the instrument detection limit which is defined as five times the standard deviation of the noise ("0" standard), five determinations are made of the "0" standard. This will be done at the conclusion of the run after the last analysis of the check standard.

Standard Operating Procedures OP-INORG 13 and 14 will be used for the measurement of lead.

Metals standards are replaced every six months. The new standard is checked against the old standard before replacement. If there is a large deviation, a certified standard is also run. If the new standard still does not match, it is remade. The preparation of the rew standard is recorded in the Metals Standards Notebook.

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## 2.9 <u>Analytical Procedures</u>

Only Acurex Standard Operating Procedures or methods found in EPA manuals, Standard Methods for the Examination of Water and Wastewater, or other standard accepted methods will be employed. Methods for Chemical Analysis of Water and Wastes (EPA, March 1983) is the standard reference for waters. Test Methods for Evaluating Solid Waste (EPA, July 1982) is the standard reference for soils. Table 2.9.1 shows the methods that will be employed for this project.

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Parameter	Matrix	Method
VOA and xylenes VOA and xylenes ICP metals Petroleum Hydrocarbons PCB TDS Anions Percent moisture EP Toxicity Phenol Alkalinity Arsenic Mercury Selenium	Soil Water Water Soil Water Soil Soil Water Water Water Water Water	5030, 8010, 8020 601, 8020 200.7 418.1 3550, 8080 160.1 SM 429 D2216-71 (ASTM) 40 CFR 216.24 420.1 SM403 206.2 245.1 270.2

Table 2.9.1 Analytical Methods

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2.10 Data Reduction, Validation, and Reporting

The following calculations will be used.

# 2.10.1 Determination of Concentration of Compound X By Internal Standard Quantitation Techniques (GC/MS Analysis)

Amount of a certain compound found in the water or soil will be calculated as follows:

Amount found (µg) = 
$$\frac{A_{compound}}{A_{I.S.}} \times \frac{W_{I.S.}}{RRF} \times \frac{V_{extract}}{V_{injected}}$$

where

 $A_{\text{compound}}$  -- area of the quantitation ion for Compound X

AI.S. -- area of the quantitation ion for the internal standard

WI.S. -- amount of internal standard (ng)

RRF -- average relative response factor determined from multilevel calibration

Vextract -- volume of extract (mL)

Vinjected -- volume injected (µL)

The concentration of Compound X in water or soil will be calculated as follows:

$$C_{\text{water}}(\mu g/L) = \frac{\text{Amount found } (\mu g)}{V_{\text{water}}(L)}$$

where

 $V_{\mbox{water}}$  is the volume of water (L) used for extraction:

$$C_{soil} (\mu g/g) = \frac{Amount found (\mu g)}{W_{soil} (dry weight)}$$

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where:

W_{soil} is the dry weight of soil (g) used for extraction

# 2.10.2 Determination of Concentration of Compound X by External Standard Quantitation Techniques (GC Analysis)

The amount of test compound analyzed by GC will be calculated as follows:  $\frac{A_{compound}}{Amount found (ng)} = \frac{A_{compound}}{RF} \times \frac{V_{extract}}{V_{extract}}$ 

where

 $A_{compound}$  -- the absolute area of Compound X

RF -- response factor determined from external standard calibration (absolute area counts/amount injected)

Vextract -- volume of extract (mL)

Vinjected -- volume injected (µ1)

Concentration of compound in water or soil will be calculated as indicated above in 2.10.1 using the appropriate units.

#### 2.10.3 Equations for General Chemical and Metals Analyses

Equations to calculate general chemical measured parameters are found in the standard operating procedures used during the determination of the specified analyte. Only in cases where the standard is worked up with the samples (such as phenol or cyanide) will there by any correction for recovery. Reporting units are in mg/L for aqueous samples for TOC, oil and grease, anions and cations; µg/L for aqueous samples for cyanide, phenols, and metals; and µg/g for soil samples. In most cases, no more than two significant figures are reported with one significant figure used for the blank.

All raw data and calculations that are not written on printed data forms will be entered into a laboratory logbook in a legible and orderly

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fashion. Example calculations and observations shall be included according to Standard Operating Procedure OP-QA6 Laboratory Notebook Procedure.

# 2.10.4 Data Integrity

Blanks, duplicates, and spiked sample analyses will be used to validate data. Blanks will be run for all analyses. The supervisor will have the analysis repeated when (1) the blank level is too high (causing the detection limit to be in the quantitative area of interest), (2) replicate analyses are outside of the QA objectives, or (3) spiked sample analyses have recoveries that are outside of the QA objectives and the blank level, or the precision, or the accuracy results do not meet the QA Plan requirements.

Other important checks on the data include the reproducibility of check standards (within 20%) and the system sensitivity compared to previous analyses (within 20%). Data transcription and calculations are also checked.

2.10.5 Data Flow

Data are generated by the analyst who performs the analysis and does the data calculations. The supervisor reviews the reduced data and forwards it to the Project Chemist, who also approves the report before submission to AeroVironment. The methods employed in the analyses shall be reported to AeroVironment. A copy of the report and raw data are kept according to Standard Operating Procedure OP-DIV 1, Chain of Custody.

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# 2.11 <u>Internal QC Check</u>

The following QC checks will be employed.

# 2.11.1 Organic Internal Quality Control Checks

Surrogate compounds will be added to all samples that are to be confirmed by EPA Methods 624 or 8240 including method blanks, duplicate samples, and matrix spikes. The compounds that will be used as surrogates and the levels recommended for spiking are given in (Table 2.11-1). Surrogate spike recoveries must fall within the limits listed in Table 2.11-2, otherwise analysis has to be repeated.

To monitor the performance of the GC/MS system, internal standards such as: bromochloromethane, 1,4-difluorobenzene, and chlorobenzene-d5 will be spiked, into each sample extract or sample to be purged, immediately prior to the GC/MS analysis.

Surrogate compounds will be run for volatile organic analysis by gas chromatography. When surrogate recovery falls below 50% for EPA Methods 601, 602, 8010, and 8020 the specific sample analysis will be repeated.

For EPA Methods 601 and 602, daily check standards will be run for all aqueous volatile organic gas chromatographic runs. Agreement to the previously prepared calibration curve must be within 35%

Organic quality control samples will be analyzed monthly. These samples will be obtained from the EPA Cincinnati and will be released by the Sample Custodian monthly at the beginning of each month. A minimum of one quality control sample for each type of analysis (e.g., purgeable GC/MS, halogenated purgeables, purgeables aromatics) will be performed monthly.

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For ston No. 2
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Table 2.11-1. Surrogates and Spiking Concentrations Recommended for EPA Methods 624 and 8240

		Amount	in Sample Ex	tract (µg)	
Compound	Fraction	Low H ₂ 0	Medium H ₂ 0	Low Soil	Medium Soil
Toluene-d ₈ 4-Bromofluorobenzene 1,2-Dichloroethane-d ₄	VOA VOA VOA	50 50 50	50 50 50	50 50 50	50 50 50

Table 2.11-2. Acceptable Recoveries of the Surrogate Compounds

Fraction	Surrogate	Water	Soil
VOA	Toluene-dg 4-Bromofluorobenzene 1,2-Dichloroethane-d4	86-119	69-127
VOA		85-121	61-122
VOA		77-120	64-129

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# 2.11.2 Inorganic Internal QC Checks

Method blanks will be run at a minimum frequency of one per batch. Duplicate analyses will be performed at a minimum frequency of one per 20 samples (5%). Matrix spike analyses will be performed at a minimum frequency of one per 20 samples (5%).

Check standards are run every 10 samples on the atomic absorption spectrophotometer and the inductively coupled argon plasma spectrometer to verify that the calibration is within 10%.

Check standards are run every 10 samples on the infrared and ultra-violet spectrometers as well as the ion chromatograph to verify that the calibration is within 10% of the original calibration curve. When the calibration is outside 10%, the instrument will be recalibrated and the previous samples rerun.

ction No. 2.12 Revision No. 1 Date: December 3, 1945 Page 1 of 1

# 2.12 Performance and System Audits

The Department of Health Services performs a systems audit every three years. Internally, systems and performance audits are performed at least once every three months by the supervisor of each area. QA samples obtained from external sources are analyzed to check performance in terms of accuracy and freedom from contamination. Notebooks, records, the employed methodology, calculations, reporting, data quality, and good laboratory practices are checked. The Division Quality Assurance Manager will also submit blind performance audit samples and conduct systems audits. In addition, AeroVironment will perform a systems audit at Acurex for the methods referenced under Section 2.9.

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# 2.13 Preventive Maintenance

Acurex currently operates a three-GC/MS unit operation and is located within 7 miles of the supplier's local Finnigan office. The preventive maintenance of the GC/MS instruments is performed on an as needed basis in addition to a thorough instrument maintenance twice a year. Extra parts such as ion sources, filament assemblies, mass analyzers, and electron multipliers are in stock at Acurex. The GC/MS Operations Manager is responsible for the preventive maintenance of the GC/MS instruments.

The preventive maintenance of the GC instruments is also done on an as needed basis by Richard Wood and Nicki Heath, who were formerly with Varian Associates. Acurex is located within two miles of the supplier's local Sunnyvale office.

The instruments used in general chemistry are maintained by the manufacturers. The atomic absorption spectrophotometer receives yearly preventive maintenance from Perkin-Elmer Corporation. The analytical balance receives preventive maintenance every 6 months. The infrared spectrometer and ultraviolet/visible spectrometer receive preventive maintenance as needed. Logbooks are kept for each instrument showing instrument problems and service. Supplies of instrument expendables are maintained on a three month basis.

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Revision No. 3
Date: October 6, 1955
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# 2.14 Specific Routine Procedures Used to Assess Data Precision, Accuracy, and Completeness

Precision will be determined through duplicate analyses. Accuracy will be determined on spiked sample analyses and performance audit analyses. Whenever accuracy, precision or completeness deviates from the goal itemized in Section 2.5, the source of the problem will be determined and corrected.

2.14.1 Precision

Precision as percent relative difference will be calculated as follows:

Precision = 
$$\frac{x_1 - x_2}{\frac{x_1 + x_2}{2}} \times 100$$

where  $X_1$  is the larger value and  $X_2$  is the smaller value of 2 replicate values.

# 2.14.2 Accuracy

Accuracy as percent recovery will be calculated from results of analyses of spiked samples as follows:

Accuracy = 
$$\frac{A - B}{C} \times 100$$

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where

- A = the analyte determined experimentally from the spiked sample
- B = the background level determined by a separate analysis of the unspiked sample
- C = the amount of the spike added

Accuracy as percent recovery will also be measured on determinations of performance audit samples.

# 2.14.3 Completeness

Completeness will be calculated as the ratio of acceptable measurements obtained to the total number of planned measurements.

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# 2.15 Corrective Action

Corrective actions are initiated whenever measurement precision, accuracy, or completeness deviate from the objectives established in Section 2.5. In addition, corrective actions are initiated whenever problems are identified through the internal auditing procedures described in Section 2.12.

Corrective actions begin with identifying the source of the problem. Examples of potential problem sources include failure to adhere to prescribed measurement procedures, equipment malfunction, or systematic contamination. Corrective actions appropriate for these problems (respectively) are more intensive staff training, equipment repair followed by a more intensive preventive maintenance program, and removal of the source of contamination.

The supervisor has the primary responsibility for initiating and completing corrective actions for measurement systems. The QA Manager monitors the progress of corrective actions and ensures that they proceed in a timely manner. The Project Manager approves all corrective actions, and depending on the severity of the problem, obtains concurrence from the client.

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# 2.16 QA Reports to Management

The GC/MS Operations Manager, GC Task Leader, and Inorganic Chemistry Manager are responsible for evaluating measurement accuracy and precision on a routine basis, and reporting results from the evaluations to the Laboratory Director and the QA Manager. Reports on corrective actions and their resolution are prepared by the responsible individual and submitted to the QA Manager and the Laboratory Director. Each analytical report will include data quality information.

Appendix A Revision No. 0 Date: December 8, 1986

APPENDIX A

STANDARD OPERATING PROCEDURES

# DEPARTMENT OPERATING PROJECURE

OP-DIV 1 PAGE 1 of 3 DATE: February 4, 1988

Replaces: February 15, 1984

PROCEDURE TITLE: Chain of Custody Procedure

AREA OF APPLICABILITY: Acurex Analytical Laboratory

#### PROCEDURE:

#### 1. General

1.1 Documentation of the possession of a physical sample or other evidentiary materials is important to insure that a sample is traceable from the time it is collected until it is introduced as evidence in legal proceedings. Failure to provide accurate documentation may result in unnecessary challenges to data validity. In order to minimize these risks the following procedures must be followed.

#### 2. Sample Storage

- 2.1 Samples should be delivered directly to the Acurex Sample Custodian. Registered or certified freight is also acceptable. Samples and information regarding samples is to be signed into custody of the Sample Custodian using Chain-of-Custody forms. The samples must be stored in a secure area until analysis is completed or samples are returned to the customer. Samples requiring maximum custody will be held in locked coolers in the walk-in or outside the walk-in in the locked Sample Control area for storage at room temperature. The Sample Custodian will maintain a log of all samples or extracts under extra lock-and-key.
- 2.2 When samples are removed from the Sample Control area, they will be checked out by signing the person's name, date, the sample traveller, and a rough description (such as 8 gallon ambers or 6 cyanides). The check-out list will be kept on the walk-in wall. Samples requiring maximum custody will be signed out using chain-of-custody forms. The sample custodian will release samples for analysis that are under extra lock-and-key.
- 2.3 When samples are returned to Sample Control, they will be returned to the shelf designated for that purpose (shelf A in the walk-in for cold storage and shelf J outside the walk-in for warm storage). The person who returns the sample will place his signature and date in the appropriate space on the check-out list. Sample Control personnel will then replace the samples in the original storage location. Maximum custody samples will be signed back to the Sample Custodian using chain-of-custody forms and be placed back under extra lock-and-key by the Sample Custodian.

OP-DIV 1 PAGE 2 of 3 DATE: February 4, 1985

Replaces: February 15, 1984

#### 3. Extract Storage

- 3.1 When extractions are started, all related information will go onto a page in the extraction bench sheet at that time. When a vial is capped, the final volume will then be written on the bench sheet. After a traveler is finished, all extracts will go into one or more vial holders (no more than one traveler to a vial holder). The vial holder will be labelled with the traveler number and the type of analysis on the outside of the box on the short side. The vial holder will then be taken to the designated refrigerator in the GC/MS Laboratory. The extract list will be filled out listing the name of the person, date, traveler, and type of analysis. Extracts from partially completed travelers will be kept in the extraction freezer.
- 3.2 Old VOAs and analyzed extracts from GC and GC/MS will be taken by GC and GC/MS personnel to Sample Control. The vials will be placed on shelf A in the walk-in and the vial list filled out with the name of the person, date, traveler, type of analysis and number of vials. Sample Control personnel will then relocate the vials and write the location in the Sample Control log. Maximum custody extracts and VOAs will be signed in to the sample custodian using chair-of-custody forms and stored in locked coolers in the walk-in.

#### 4. Disposal of Samples

- 4.1 Normal samples will be disposed in a safe manner two months after the report is sent to the customer. Extracts and digests will be held for three months after the report is sent.
- 4.2 EPA samples and extracts as well as in-house customer samples and extracts will be disposed only when Sample Control receives permission from the project manager.

#### 5. Reports and documents

- 5.1 All data, reports and documents pertaining to samples are to be assembled according to document control procedures and kept in a secure area.
- 5.2 Industrial reports are stored by customer name. The current reports come first, followed by last year's reports, and finally reports from the year before last. After two years, reports are stored off-site. Whenever a file is removed an "out card" will be inserted in its place with the name of the file, the name of the person removing the file, and the date.

OP-DIV 1 PAGE 3 of 3

DATE: February 4, 1985

Replaces: February 15, 1984

5.3 Raw data of industrial analyses is stored for only one year on-site. Unlike final reports, raw data is stored by traveler number.

Approved by:

Date: 3-7-85With Date: 3/e/85

Reviewed by: Tal B. Wilhte
Ted 3. willhite

# TECHNICAL OPERATING PROCEDURE

OP-DIV 3 PAGE 1 OF 2

DATE: October 28, 1983

Replaces: OP-DIV 3 January 19, 1982 OP-QA-1

January 15, 1982

PROCEDURE TITLE: SECURITY OF LABORATORY

AREA OF APPLICABILITY: Acurex Analytical Laboratory, Organic Extraction Area

SCOPE:

#### PROCEDURE:

#### Exterior Doors

- 1.1 All exterior doors will be kept locked and closed unless fully monitored by an Acurex employee. The front door will be unlocked during business hours while an Acurex employee is at the front desk. If the employee leaves the reception area, the front door will be locked.
- 1.2 Fully monitored is defined as the Acurex employee having complete knowledge whether someone has entered the building or not entered.

#### 2. Visitors

- 2.1 Visitors to facilities will be fully monitored by Acurex personnel until they enter the facilities' offices. Facilities personnel will monitor their visitors back to the reception area or out the door if the reception area is empty.
- 2.2 Most visitors to EED personnel will sign-in, receive a cloth Acurex identification tag, be escorted while in the building, and sign-out.
- 2.3 Visitors do not include Acurex personnel who have an Acurex identification badge (permanent or temporary) and Acurex contractors who have an Acurex "C" identification badge.

#### 3. Unauthorized Entry

3.1 Visitors who are not escorted will be challenged. The visitor should be escorted to the person who is being visited or out the door. The visitor should be logged-in if that has not been already performed. If the visitor will not comply with verbal requests, Acurex Security should be notified immediately.

OP-DIV 3 PAGE 2 OF 2 DATE: October 28, 1983

Replaces: OP-DIV 3 January 19, 1982 OP-0A-1 January 15, 1982

## PROCEDURE (Continued)

#### Interior Doors

- 4.1 The sample custodian is responsible for locking the walk-in refrigerator at the end of his shift. Anyone using the walk-in refrigerator after the sample custodian has left is responsible for maintaining its security.
- 4.2 The last person in the water laboratory is responsible for locking all interior doors in the water laboratory. The last person in the GC/MS is responsible for locking all interior doors in that area. The receptionist is responsible for locking the front office files at the end of his shift. Anyone using those files after the receptionist has left is responsible for maintaining their security.

#### 5. Data Archives

- 5.1 All EPA reports and original raw data will be placed into on out of the locked files by only the document control officer.
- 5.2 Industrial reports and raw data will be placed into laborator. files by a member of the operations group. Reports and data may be removed by inserting an "out" card in place of the file. This card will have the name of the person using the file, date, and title of file.
- 5.3 Industrial reports will be put in cold storage after 2 years. Industrial raw data will be put in cold storage after 1 year.

Approved by: ./

John H. Taylor

Date: 11-11-83

Laboratory Director

Reviewed by:

Date: Nov. 28, 1983

#### DEPARTMENT OPERATING PROCEEDURE

OP-DIV 5 PAGE 1 of 2

DATE: August 30, 1984 REPLACES: Original

PROCEDURE TITLE: Sample tracking on IFBs

AREA OF APPLICABILITY: Acurex Analytical Laboratory

#### PROCEDURE:

#### 1. Sample Preparation

1.1 Preparation of IFB samples will be documented. All analysts will have a permanent laboratory notebook. Bench sheets will be used to denote when sample extraction starts, finishes, and when samples are delivered to instrumentation area (bottled date). Notebook pages and bench sheets will show the EPA case number and sample number. The initials of all analysts working on extractions will be written on the bench sheet as well as the date.

#### 2. Sample Analysis

2.1 The analysis of IFB samples will be documented. All analysts will have a permanent laboratory notebook. Instrument logs will be used to denote when sample analysis begins. Notebook pages and instrument logs will show the EPA case number and sample number, date, and analyst initials or name. A signature record with initials will be kept by the document control officer.

#### 3. Document Filing

- 3.1 The Document Control Officer will assemble all notebook pages, bench sheets, chromatograms, computer printouts, copies of instrument logs, and other appropriate information in a case file following procedure OP-QA 4. In the case file will be a copy of the final report which will show when the report was mailed. The document file also includes a document inventory which lists all documents by serial number, case number and region number for each document.
- 3.2 After 6 months the complete case file will be purged and forwarded to EPA.

OP-DIV 5 PAGE 2 of 2 DATE: August 30, 1984 REPLACES: Original

Date: Oc- 31/194

- 4. Receipt of Vials after Analysis
  - 4.1 After the report is sent, the sample custodian will take possession of all IFB vials for a case. Six months after the case is submitted, vials will be shipped back to EPA or properly disposed. The final disposition will be recorded.

Approved	by: M. Plaine	Gerauson	Date: 8/30/84
	M. Claire Ferguson	1	
	Operations Manager	U	

Reviewed by: 1 Property Assurance

Quality Assurance Manager

#### DEPARTMENT OPERATING PROCEDURE

OP-SCC 1 PAGE 1 OF 2 DATE: 8/31/81 REPLACES: 5/28/81

PROCEDURE TITLE: Receipt and Opening of Samples

AREA OF APPLICABILITY: Acurex Analytical Laboratory Sample Control Center

#### PROCEDURE:

All packages received by Acurex Laboratory Shipping and Receiving Department which are not clearly marked as being purchased items are delivered to the Sample Control Center.

Upon receipt the package will be opened by the Sample Custodian. The contents and any paper work will be examined. If the containers are broken or if there is leakage, the custodian will wear disposible gloves when handling the sample(s), and then properly dispose of the packing materials. If the sample has a strong odor or appears volatile, it will be placed immediately in a hood area.

All caution statements that arrive with the sample or are on the package should be noted, ie., toxic, caustic, flammable.

If a letter, P.O., request form, or other correspondence is included in the package, it is used to check the contents. The Sample Control Pending Work File and the Master Client Card File are also checked for pertaining memos, P.O.'s, correspondence or information.

All information is checked and any deviations are noted on the correspondence and/or traveler.

If the samples are time critical they will be logged-in first. The project chemist should be notified at once.

If there are questions or problems the following procedures will apply:

- 1. If there are broken samples or unmatched sample ID's or codes, the Sample Custodian may contact the client directly to resolve these problems.
- 2. If there is no correspondence or information in either the Work Pending File or the Standing Order Customer Card File, the Sample Custodian will notify the Marketing Manager and the Lab Supervisors to determine the originator of the job. The originator will then call the client to resolve the problem.
- 3. Problems should be resolved in the quickest manner so that analysis can begin as soon as possible.
- 4. Correspondence (P.O., memo, request) which arrives separately from the sample should be stamped with the date received and filed alphabetically in the Work Pending File.

# DEPARTMENT OPERATING PROCEDURE

- 5. Special instructions concerning a group of samples will be followed as much as is possible within the sample log-in procedure.
- 6. Samples that are involved in court cases should be handled according to OP-DIV 1, Chain-of-Custody Procedure.
- 7. When correspondence has remained in the Work Pending File in excess of 15 days and no samples have been received, the correspondence will be taken from the file and turned over to Marketing (or other originator) for handling and follow-up with the client.
- 8. Purchase Orders
  - 8.1 When P.O.'s are received with the samples, they will be processed with the other paperwork and attached to the traveler.
  - 8.2 When a standing P.O. (one which covers more than one shipment of samples) is received it will be stamped with the date received. A copy of the P.O. will be kept in the P.O. Tickler File in the month of expiration. The P.O. number will be noted in the Customer Card File. The original will be placed in the Customer Contract File.
  - 8.3 When P.O.'s are received independently of the smaples:
    - 8.3.1 They are stamped with the date received.
      - 8.3.1.1 If the samples have already arrived and have been logged-in, the appropriate traveler is found and the P.O. is attached.
      - 8.3.1.2 If the samples have not been received the P.O. is placed in the Work Pending File along with any other correspondence.
  - 8.4 When P.O.'s are received after the job is completed and invoiced:
    - P.O. is stamped with date received and the P.O. number is noted in the Request for Invoice Log. The P.O. is then filed in the Client Final Report File with the appropriate traveler.

Approved by:

anun Inda K. Bohannon, Manager

Sample Control Center

Reviewed by:

us sagnam

Date: 9/3/8/
Date: 9/3/8/

Erick Hagmann Quality Assurance

#### TECHNICAL OPERATING PROCEDURE

OP-SCC 3 PAGE 1 of 3

DATE: July 24, 1985

Replaces: OP-SCC 3

August 31, 1981

PROCEDURE TITLE: Sample Custodian Duties

AREA OF APPLICABILITY: Acurex Analytical Laboratory, Sample Control Area

SCOPE: Description of Responsibilities and Duties of Sample Custodian

#### PROCEDURE:

#### 1. Receiving Samples

- 1.1 The Sample Custodian responsibilities include controlling the sample from receipt through analysis to the disposal of the sample. Upon receipt of samples, the Sample Custodian will check for the presence of work orders or other information about sample analysis from the project managers and sales staff in the Work Pending File. The Master Client Card File will be checked for additional information. If necessary, the project managers or sales staff will be consulted.
- 1.2 The Sample Custodian will check the condition and integrity of sample containers to see if they are intact, not leaking, and properly preserved. After sample integrity has been assured, the samples will be logged-in.
- 1.3 The Sample Custodian will assign an Acurex identification number in the Sample Control Log Book and record the client name, date of arrival, number of samples, and the due date of the report.
- 1.4 When IFB samples do not arrive on time or when a problem comes up from the paperwork with IFB samples such as missing samples, broken chain-of-custody seals, or unusual instructions, the Sample Custodian will notify the IFB project manager and Sample Management Office.

#### 2. Traveler

2.1 The Sample Custodian will completely fill out a blue traveler for each batch of samples. This includes: client informaton, areas involved in analysis, report writer, laboratory ID number, charge number, sample location, number of samples, type of samples, holding time, EPA case number for IFB samples, whether samples are known or suspected to be hazardous, date traveler issued, date samples received, associated due dates, special instructions, customer sample identification, corresponding Acurex identification, required analyses and quality assurance, and billing information.

OP-SCC 3 PAGE 2 of 3 DATE: July 24, 1985

Replaces: GP-SCC 3

August 31, 13.1

2.2 The front side copies of the traveler will be distributed to the appropriate laboratory supervisors and the project manager/sales representative.

- 2.3 If corrections, additions, or deletions need to be made to any traveler, copies of the revised edition will be marked with a yellow highlighter pen "revised," dated, and initialed.
- 2.4 All correspondence, memos, PO's, phone messages, bills of lading and technical information will be attached to the original blue traveler and held in the Sample Control Center until the job is completed.
- 2.5 Each sample bottle will be labeled with the assigned laboratory ID number and stored according to OP-DIV 1.

# 3. Sample Access and Disposal

- 3.1 The Sample Custodian will see that all samples are stored in controlled access areas according to OP-DIV 1.
- 3.2 Samples will be disposed by the Sample Custodian in a safe manner following OP-DIV 1, OP-SCC 4, and OP-ORG 28. Water samples that do not contain significant levels of known hazardous materials will be diluted and washed down the drain. Soil or sludge samples that do not contain significant levels of known hazardous materials will be placed in the trash with the sample container lids removed. Liquid organic samples which are not known to be hazardous such as oil, will be disposed into the flammable solvent drum. Hazardous materials will be collected and sent to a Class 1 dump. The project manager will make the determination as to whether a sample is hazardous or not.

#### 4. Weekly Status Reports

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4.1 Each week the Sample Custodian will prepare an input into the Status Report on all new samples within the past week. This includes the traveler number, number of samples to be analyzed within each area of the laboratory, due date, and price.

OP-SCC 3 PAGE 2 of 3

DATE: July 24, 1988

Replaces: OP-SCC 3

August 31, 1911

4.2 The Sample Custodian will also fill out the weekly IFB report on the number of samples received and status of late reports. The report will then go the laboratory director for his approval before mailing to Sample Management Office.

Approved by:

Date: 7-25-85

Manager, Inorganic Chemistry

Reviewed by: Such of Sil

Date: 7-25-85

Sarah R. Schoen, Ph.D.

#### INSTRUMENT OPERATING PROCEDURE

OP-INORG 13 PAGE 1 of 1

DATE: August 29, 1984

PROCEDURE TITLE: AAS Setup for Heated Graphite Furnace Determinations

AREA OF APPLICABILITY: Acurex Analytical Laboratory, Inorganic Analysis Area

SCOPE: Setup of Perkin-Elmer 460 Atomic Absorption Sepatrophotometer For Heated Graphite Furnace Determinations.

#### PROCEDURE:

- 1. Instrument Setup
  - 1.1 Refer to Instrumental Operating Procedure "Atomic Absorption Spectrophotometer Setup For Flame Determinations". Section 1.
- 2. Heated Graphite Furnace Setup
  - 2.1 Install HGA furnace. Check alignment of furnace with AA in absorbance mode. Replace graphite tube and adjust injector for proper fit. Fill acid rinse reservoir and clean furnace windows. Turn on cooling water and purge gas. Refer to "Analytical Methods For Atomic Absorption Spectroscopy" for proper dry, char, and atomization temperatures.
- 3. Calibration Programming
  - 3.1 Refer to Instrumental Operating Procedure "Atomic Absorption Spectrophotometer Setup For Flame Determinations".

Approved by: They have	Date: Aug 30 1484
Greg Nigoll Manager, Inorganic Chemistry	

Reviewed by: Date: Ocr31, 1954

Ted B. Willhite

#### INSTRUMENT OPERATING PROCEDURE

OP-INORG 14 PAGE 1 of 1

DATE: August 29, 1984

PROCEDURE TITLE: Atomic Absorption Analyses

AREA OF APPLICABILITY: Acurex Analytical Laboratory, Inorganic Analysis Area

SCOPE: Treatment of Samples During Atomic Absorption Analysis - Flame or HGA

PROCEDURE:

#### I. Standards

- 1.1 Refer to "Analytical Methods for Atomic Spectroscopy" for appropriate standard levels. Standards are checked against a National Bureau of Standards certified reference material where applicable.
- 1.2 Samples are bracketed by the standards. Any sample read as off scale is diluted to a suitable level. Calibration checks are run every 5-10 samples. A greater than 10% drift indicates the need for recalibration.

## 2. Matrix Checks

2.1 Each type of sample matrix is checked by methods of standards addition. If there is more than a 10% difference between the straight reading and the standard addition run, all samples should be quantitated by MOA.

#### 3. Quality Control

3.1 Quality control normally consists of ten percent duplicate samples, ten percent spike samples and a method blank per batch.

Reference: "Analytical Methods For Atomic Absorption", Perkin-Elmer Corp.

Approved by: String Licall Date: Aug 30 1989

Greg Nicoll

Manager, Inorganic Chemistry

Reviewed by: Tab Wilht Date: Ocasi, 1984

#### TECHNICAL OPERATING PROCEDURE

OP-0A 6

PAGE 1 of 1

DATE: March 1,1984

Replaces: Original

PROCEDURE TITLE: Laboratory Notebook Policy
AREA OF APPLICABILITY: Acurex Analytical Laboratory

#### PROCEDURE:

- 1. General Requirements
  - 1.1 All raw data and calculations that are not written on printed data forms will be correctly entered into a laboratory logbook in a legible and orderly fashion such as tables.
  - 1.2 Example calculations and units will be included.
  - 1.3 Observations and conclusions will be included.
  - 1.4 If the procedure can not be found in a SOP, published method, or in a contract, it will be written. A reference to the procedure and any changes will be written.
  - 1.5 The sample traveler number and customer ID number will be included.
  - 1.6 The date that the work was started will be written.
  - 1.7 Only black ink should be used. No white-out will be used. Where part of a page is left blank, an " $\chi$ " should be used to fill in the remainding space.
- Requirements for work that may go to court (IFB, etc.)
  - 2.1 All pages used will have the case # written on the page (only one case per page). Also the signature of the person doing the work and a co-signer will appear on each page.

2.2 Copies of notebook pages will go to the document control officer.

Approved by:

Greg Micoli

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Operations Manager

Reviewed by:_

agmann 3/29/84

Erick Hagmann

APPENDIX F

Chain of Custody Forms

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changed) COPY 2 SAMPLE COLLECTED BY Name	<u>_</u> _	10.4.55C	SIGNAPURE AUTOVON	
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REASON FOR	_		-COMPLAINT F-FOLLOWUP/CLEANUP	
BASE SAMPLE NUMBER	4	- 10 0390	CONTROL AND THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESERVE TO THE RESER	
		ANALYSES REQUESTED		
GROUP A	Γ	00900 Hardness	Residue, Settleable 50086 2. C. GROUP	
Ammonia 00610	L	Iron 01045	Residue, Volatile Bromoform	1104
00340 Chemical Oxygen Demand	L	Lead 01051	Silica Bromodichloromethane	101
Kjeldahl Nitrogen		Magnesium 00927	Specific Conductance Carbon Tetrachionide	105
Nitrate 00620		Manganese 01055	Sulfate Chloroform	2106
Nutrate 00615		Mercury 71900	Sulfite Chloromethane	4419
Oil & Grease 00560	L	Nickel 01067	Surfactants -MBAS 38260 Dibromochloromethane	2105
Organic Carbon 00680		Potassium 00937	Turbidity Methylene Chloride	442
Orthophosphate 00671		Selenium 01147	Tetrachloroethylene	11_2
Phosphorus, Total 00665		Silver 01077	I, I, I-Trichloroethane	45.0
		Sodium 00929	Trichloroethylene	-181
GROUP D	L	Thallium 01059	BHC Isomers Linatomethanes	115
Cyanide, Total 00720	L	Zinc 01092	Chlordane PCBs	35[⊼ ———
Cyanide.Free 00722	L		DDT Isomers 39370	نوب
	L		Dieldrin 39380 x ANU 225-154	-7
GROUP E	1	GROUP G	Endrun 39390	
Phenols 32730		Acidity. Total 70508	Heptachlor 39410 X No. Co. No.	
	X	Alkalinity, Total	Heptachlor Epoxide 39420 TC K ESA .	).Z
GROUP F		Alkalinity, Bicarbonate 00425	Lindane	
Antimony 01097	L	Bromide 71870	Methoxychlor 39183	
Arsenic 01002	L	Carbon Dioxide 00405	Toxaphene 39400	
Bartum 01007	L	Chloride 00940	2.4-D 39730 ON SITE ANALYSES	
Beryllium 01012	<u> </u>	Color 00080	2,4,5-TP-Silvex 39760 Parameter Value	
Boron 01022	-	Fluoride 00951	2,4,5-T 39740 Flow 50050	- <u>;</u> 1
Cadmium 01027	1	Todide 71865	Chiorine, Total	71 <u>4</u>
Calcium 00916	_	Odor 00086	Dissolved Oxygen	** g*
Chromium, Total 01034	L	Residue, Total 00500		<u>-ni's</u>
Chromium VI 01032	~	Residue, Filterable (TDS) 70300	GROUP J Temperature 00010	∍C
Copper 01042	L	Residue Nonfilterable 00530	Sulfides 00745	
COMMENTS AV '-	_	76 <i>0</i>	<del> </del>	
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ENVIRONMENTAL	SAMPLING DATA	OEHL USE OHLY	
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		BASE WHERE SAMPLE COLLECTE	
		SAMPLING SITE DESCRIPTION	
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DATE COLLECTION BEGAN	TIME COLLECTION BEGAN	COLLECTION METHOD	
13- YYMMDO3	124 hour clock) 1605	COMPOSITE	HOURS
MAIL ORIGINAL		L/TS BROOKS	156 -
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SAMPLE CALLECTED BY . Vemp.		SIGNATURE	AUTOVON
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BASE SAMPLE NUMBER	20457	COMPANY OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STA	
	ANALYSES REQUESTED	check appropriate blocke)	
GROUP A	Hardness 00900	Residue, Settleable 50086	GROUP T
Ammonia 00610	Uron 01045	Residue, Volatile 00505	Bromoform 32104
00340 Chemical Oxygen Demand	[Lead 01051	Silica 00955	Bromodichloromethane 32101
Kjeldahl Nitrogen 00625	Magnesium 00927	Specific Conductance 00095	Carbon Tetrachionde 32102
Nitrate 00520	Manganese 01055	Sulfate 00945	Chloroform 32106
Nutrate 00615	Mercury 71900	Sulfite 00740	Chioromethane 34418
Oil & Grease 00560	Nicket 01067	Surfactants -MBAS 38260	Dibromochloromethane 32105
Organic Carbon 00680	Potassium 00937	Turbidity 00076	Methylene Chlonde 34423
Orthophosphate 00671	Selenium 01147		Tetrachloroethylene 344" 4
Phosphorus, Total 00665	Sulver 01077		1.1.1-Trichloroethane 34506
	Sodium 00929	GROUP H	Trichloroethylene 19183
GROUP D	Thailium 01059	BHC Isomers 39340	Trihalomethanes 32080
Cyanide, Total 00720	Zinc 01092	Chlordane 39350	PCBs
Cyanide, Free 10722		DDT Isomers 39370	X V 1 - R. 6. /2 -
		Dieldrin 39380	X Ac - 11 - 11 - 11 - 11 - 11 - 11 - 11 -
GROUP E	GROUP G	Endrin 39390	CARB. S. EY :1
Phenois 32730	Acidity, Lotal	Heptachlor	
	Alkalinity, Total	Heptachior Epoxide	
GROUP F 01097	Alkalinity, Bicarbonate	Lincane	
Antimony	Bromide	Methoxychior	<del>-  </del>
(rsenic 01002	00040	10720	ON SIZE AND LUZZE
Barium 01007	Citional	2.4-0	ON SITE ANALYSES Parameter Value
Beryllium 01012	Calor 00080	2,4,5-TP-Silvex 39760	50050
01022	Fluonde 00951	2,4,5-T	F10W mgd
Cadmium 01027	Todide 71865		Chlorine, Total ng 1
Qalcium 00916	00500	<del>                                     </del>	Dissolved Oxygen Tgr
Chromium, Lotal	Residue, Lotal		pes units
Chromium VI 01032\ - 01042	Regulate, Filterable (TDS) 70300	GROUP J 00745	Temperature 00010 3C
COMMENTS A	Residue Nonfilterable	Sulfides	<b></b>
AU	4 63B		

	ENVI	RONMENTA	L S	AMPLING DATA			ORINL USE ONLY	$\prod$	T				
r	Use this space for	mechanical i	прен	10)			MPLING SITE DENTIFIER	7	Ť,			-	
l						87	ASE WHERE SAMPLE CO	LLECTI	ED.	<u>ч</u> д			
ĺ		-					MATICAL  IMPLING SITE DESCRIP						
l						5.	_						
6	ATE COLLECTIO		T	IME COLLECTION BEG	AN	c	DLLECTION METHOD	- 7700					
L	136 TYMDD	-11,21	1	(24 hour clock) 071	<u> </u>		GRAB COM	POSITE		но	URS		
R	MAIL ORIGIN.	AL	1	USAT	<u> </u>	- 1-	IL BR	ز عبد	1.	1-13			
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	hanged) COPY 2	4 1 1	Gee	ode AESC		T s	ICHTA TURE		<u> </u>		TAUTOV	ON.	
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	EASON FOR UBMISSION			A-ACCIDENT/INCIDEN R-ROUTINE/PERIODIC			OMPLAINT F.FOI	LOWUP HER/spe	/CL ecify	EANUP	112	ي ر	,
	BASE SAMPLE	NUMBER	<	7 800	156		edis, Pie		ر ان ۲				
				ANALYSES REQU		ch	eck appropriate blocks)						
L		GROUP A	$\perp$	Hardness	00900	L	Residue, Settleable	50086	6			GRO	UPT
L	Ammonia	J061		lron	01045	L	Residue, Volatile	00505	L	Bromof	onn.		32104
L	Chemical Oxyge	n Demand		Lead	00927	L	Silice	00095			uchlorom		10 37107
⊢	Kjeldahi Nitroge	en 90620		Magnesium	01055	L	Specific Conductance	00945	$\vdash$		Tetrach	londe	32106
┞	Nitrate	2061	1/	Manganese	71900	┡	Sulfate	00740	1	Chioro			34418
⊢	Numte	J0560	ĸ	Mercury	01067	┞	Sulfite	38260	1		methane		
-	Oil & Grease	20680	-	Nickel	00937	-	Surfactants -MBAS	00076	$\vdash$		ochlorom		14423
┝	Organic Carbon	20671	-	Potassium	01147	┝	Turbidity		╁╌		ene Chlo		34475
$\vdash$	Orthophosphate Phosphorus, Tot	2066	1	Selenium Silver	01077	<del> </del>			╁╌		hloroethy Trichloroe		14506
1	Phosphords, 10t	.41	1	Sodium	00929		, GRO	UPH	╁╴		roethyle		:3130
r	FF	GROUP D	1	Thallium	01059		BHC Isomers	39340	T		methane		8_080
	Cyanide, Total	J0720		Zinc	01092	Г	Chlordane	39350	T	PCBs			19515
	Cyanide, Free	00722					DDT (somers	39370	X	1/JL	12 0	24/	رد. د
							Dieldrin	39380	X	AN:	Y.L.		
L	22600	GROUP E		GRO	UP G	L	Endru	39390	1				
L	Phenols	3273	1	Acidity, Total	70508	L	Heptachlor	39410					
		· · · · · · · · · · · · · · · · · · ·	$\vdash$	Alkaunity, Total	00410	L	Heptachlor Epoxide	39420 39782				_	
Ľ		GROUP F	,	Alkalinity, Bicarbona	71870	$\vdash$	Lindane	39782 39480	L J				
-	Antimony		4	Bromide	00405	<b>-</b>	Methoxychlor	39400					
Б	Arsenic	0100	┿	Carbon Dioxide	00940	-	Toxaphene	39730					
F	Bartum	0101	+	Calca	00080	-	2,4-D 2,4,5-TP-Silvex	39760	╄	aramete	ITE ANA	Valu	
$\vdash$	Beryllium	0102		Color	00951	$\vdash$		39740	╁		50050	+	
5	Boron Cadmium	0102		Fluoride Iodide	71865	┝	2,4,5-T		1.5	low	To 50060	+	
5	Calcium	0091	;	Odor	00086	H		-			950,166	-	— <u>γ γ .</u> 1 αυπ
7	Chromium, Total	0103	+	Besidue, Total	00500	$\vdash$			PI		00400	<del>                                     </del>	unit's
Г	Chromium VI	0103		Residue, Filterable (TD)	5)70300	Ţ,	GRO	UP J			ure)0010		- <del> </del>
	Copper	0104	2	Residue Nonfilterable	00530		Sulfides	00745	Ė				
٥	OMMENTS		,										
		ė	H	14 639									
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ENVIRONMENTAL	L SAMPLING DATA	OEHL USE ONLY	
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		BASE WHERE SAMPLE COLLECTED	
1		SAMPLING SITE DESCRIPTION	
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DATE COLLECTION BEGAN	TIME COLLECTION BEGAN	TIDD DISPOS 1 - A	
1516 112 111	124 hour clock) 045	GRAB _ COMPOSITE _	HOURS
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SAMPLE COLLECTED BY Name		SIGNATURE	MOVETUA
REASON FOR SUBMISSION	A-ACCIDENT INCIDENT	C-COMPLAINT F-ROLLEWUP/C	
	455	CONTRACTOR	
	ANALYSES REQUESTED	check entropyers blocks	C. C. C. C. C. C. C. C. C. C. C. C. C. C
GROUP A	)0900	50086	GROUP T
00610	Hardness 01045	Residue, Settleable 00505	32104
Ammonia  00340 Chemical Oxygen Demand	01051	Residue, Volatile 00955	Bromoform 32101
1 1 00625		Silica 00095	Bromodichloromethane  Carbon Tetrachloride
Kjeldahl Nitrogen 00620	Magnesium 01055	Specific Conductance O0945 Sulfate	Chloroform 32106
Nitrate 00615	Manganese 71900	Sulfite 00740	Chloromethane 34418
Oil & Gresse 00560	Mercury 01067	Surfactants -MBAS 38260	Dibromochloromethane 32105
00680	Nickel 00937	00076	24473
Organic Carbon	Potassium 00937	Turbidity	Methylene Chloride
Orthophosphate	Selenium 01077		Tetrachloroethylene  1.1.1-Trichloroethane
Phosphorus, Total	Silver 01077	GROUP H	Trichloroethylene
GROUP D	Sodium 01059	BHC Isomers 39340	Trihalomethanes 51,8)
Cyanide, Total 00720	Zunc 01092	Chlordene 39350	PCBs 39515
00727		DDT Isomers 39370	NOL ORG GUIBURD
Cyanide Free 00722		Dieldrin 39380	(AN. 200 - 577 436
GROUP E	GROUP G	Endrin 39390	100000000000000000000000000000000000000
Phenois 32730	2.2 3.6. 2.2 .2 .2	Heptachlor 39410	1
THERIOIS	Alkalinity, Total 00410	Heptachlor Epoxide 39420	
GROUP F	Alkalinity, Bicarbonate 00425	Lindane 39782	
Antimony 2 01097		L _ L	
Arsenic 01002	<del></del>	Toxaphene 39400	<u> </u>
Barrum 01007	<del></del>	2.4-D 39730	ON SITE ANALYSES
Beryllium 01012	<del></del>	2,4,5-TP-Silvex 39760	Parameter Value
Boron 01022	<del></del>	2,4,5-T 39740	Flow 50050 mgd
Cadmium 01027			Chlorine, Total mg
Calcium 00916			Dissolved Oxygen mg-
Chromium, Total 01034			pH 00400 units
Chromium VI 01032	<del></del>	GROUP J	Temperature 00010 oC
Copper 01042	Residue Nonfilterable 00530		
COMMENTS			
AVEC	g <b>5</b> )	Ī	
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Use this spece for mechanical im-	print)	SAMPLING SITE IDENTIFIER OI 27	
ł		BASE WHERE SAMPLE COLLECTE	
		SAMPLING SITE DESCRIPTION	
		7 )	
DATE SOLLECTION BEGAN	TIME COLLECTION BEGAN (24 hour clock)	COLLECTION METHOD	
10/11/11/15	- 153	TAB COMPOSITE	
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SAMPLE COLLECTED BY Name	Grada AESC)	SIGNATURE /	/ AUTOVON
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REASON FOR		C-COMPLAINT F-FOLLOWUP	
BASE SAMPLE NUMBER		- com pro di la company	
	42 3- 720		
GROUP A	ANALYSES REQUESTED (	50086	GROUP T
20619	Hardness 31045	Residue, Settleable	32104
Ammonia 00340	1ron 01051	Residue, Volatile 00955	Bromoform 32101
Chemical Oxygen Demand		Silica 00095 Specific Conductance	Carbon Tetrachlonde
Kjeldahl Nitrogen Nitrate	Magnesium 01055 Manganese	Sulfate 00945	Chloroform 32106
90615	Mercury 71900	Sulfite 00740	Chloromethene 34418
Oil & Grease 00560	Nickel 01067	Surfactants -MBAS 38260	Dibromochloromethane 32105
Organic Carbon 00680	Potassium 00937	Turbidity 00076	Methylene Chloride 34423
Orthophosphate 00671	Selenium 01147		Tetrachloroethylene 144"5
Phosphorus, Total 90665	Silver 01077		1,1,1-Trichloroethane 34506
	Sodium 20929	GROUP H	Trichloroethylene 19180
GROUP D	Thallium 01059	BHC Isomers 39340	Trihalomethanes 32080
Cyanide, Total 00720	Zinc 01092	Chlordane 39350	PCBs 39516
Cyanide Free 00722		DDT Isomers 39370	· <del>/ </del>
		Dieldrin 39380	<u> </u>
GROUP E	GROUP G 70508	Endrun 39390	A Careta
Phenois 32730	Acidity. Total	Heptachlor	<del>1</del> <del></del>
State of the second second	Alkalinity, Total	Heptachlor Epoxide	<del></del>
GROUP F (	Alkalinity, Bicarbon ate 00 125	Lindane 39480 Methoxychlor	<del></del>
Anumony	Biograe	Toxaphene 39400	+
Arsenic 01002 Barium 01007	Carour Dioxide	2,4-D 39730	ON SITE AMALYSES
Beryllium 01012	Cinoride	2,4,5-TP-Silvex 39760	
01022	.mes1	2,4,5-T 39740	Flow 50050 -gd
Cadmium 01027	1 It inquide	2, 7, 3-1	Chlorine, Total mg
Calcium 00916			Dissolved Oxygen mg/
Chromium, Total 01034			pH 00400 units
Chromium VI 01032		GROUP J	Temperature ⁰⁰⁰¹⁰ ⊃C
Copper 01042	Residue Nonfilterable 00530	Sulfides 00745	
COMMENTS			
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ENVIRONMENTA	L SAM	PLING DAT	A	OEHL USE ONLY	
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ł				BASE WHERE SAMPLE COLLECTES	
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1			Ì	SAMPLING SITE DESCRIPTION	
DATE COLLECTION BEGAN	TIME	COLLECTION	BEGAN	COLLECTION METHOD	シャナーリー
19 (YYMMDD)		hour clock)	4,5	GRAB COMPOSITE	HOURS
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SAMPLE COLLECTED BY Name		AFSC)		SIGNATURE	AUTOVON
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REASON FOR SUBMISSION		ACCIDENT INC ROUTINE PER		NINPDES O-OTHER (spec	
BASE SAMPLE NUMBER	5/7	ی دی	0401	GUIL PIG	
		ANALYSES		check eppropriate blocks)	
GROUP A		rdness	70900	Residue, Settleable 50086	GROUP T
Ammonia 00610	l liro	on	01045 01051	Residue, Volatile 00505	Bromoform 32104
Chemical Oxygen Demand	Le	ead	01051	Silica 00955	Bromodichloromethane 32102
Kjeldahi Nitrogen 00625	Ma	gresium	01055	Specific Conductance	Carbon Tetrachloride 32106
Nitrate	Ma	nganese		Sulfate	Chloroform
Nutrate 00615	_	ercury	71900	Sulfite 90740	Chloromethane 34418
Oil & Grease 30560	N:	ckel	01067	Surfactants -MBAS 38260	Dibromochloromethane 32105
Organic Carbon 00680	Po	tassium	00937	Turbidity 00076	Methylene Chloride 34423
Orthophosphate 00671		ieu inui	01147		Tetrachiomethylene 34475
Phosphorus, Total 00665	Sil	lver	01077		1.1.1-Trichloroethane 34500
	So	dium	00929	GROUP H	1 richioroethylene
GROUP D 00720	+ + -	nallium	01059	BHC Isomers	i rinaiomethanes
Cyanide, Total	121	inc	01092	Chlordane 39370	PCBs 77.13
Cyanide, Free 00722	++			DDT Isomers 39370	
	4 2 23	101 CE 10 CE		Dieldrin	Y Vac are less 1 ? 2
GROUP E 32730		P4   1	70508	30410	( 1~ 3.7 ST) - / 1
Phenol's 32730	1 1	cidity, Total	30410	Heptachlor	<del>. </del>
	101	kalinity, Total		Heptachlor Epoxide	XMA, Fe. Ca. My
GROUP F	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	kalinity, Bica	71870	Lindane	M- Kici
Anumony	+  P'	romide	00405	Methoxychior	(224.7)
A senie	++-	arbon Dioxide	00940	7 Toxaphene 39400 2,4-D 39730	ON SITE ANALYSES
	+ + -	hloride	00080	2.4.5-TP-Silvex 39760	Parameter Value
01022	+ +	olor	00951	30740	50050
01022	++-	luonde	71865	2,4,5-T	- 50060
Cadmium	+ 10	dide	00086		30 100 1
Catcium 00916 Chromium, Total 01034	<del>.            </del>	dor esidue, Total	00500	<del>                                     </del>	00400
01033	_	esidue, Fülterab	70300	GROUP J	Temperature O0010 -C
Chromium VI			00530	00745	1 emperature
COMMENTS A		esidue Nonfilt	ELNOTE	Sulfides	
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Reports	YYMMDD	. ว i		ck)	100						URS	
Comment   Company   Comp			111			7- 7	1		1			
SAMPLE COLLECTED BY Vene. Grade AFSC.   SIGNAPUR   SAMPLE COLLECTED BY Vene. Grade AFSC.   SIGNAPUR   SAMPLE NUMBER   SAMPLE	REPORTS	++	+++~			<del>/**, ~</del>	<u>` `</u>		<u> </u>	: <u>=</u> _		<u></u>
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RANGUERNY INCIDENT   CODMESTIT   FOLLOWID CLEANUP   A ACCIDENT   A A	SAMPLE COLLECTED BY	/			s	IGNATURE		171	7		AUTO	70N
BASE SAMPLE NUMBER   SAMALYSES REQUESTED   Check appropriate blocks		/! >		TUNCIDENT		OMBI AINT	<u></u>	00000	<u></u>	EANUE	<u> </u>	
AMALYSES REQUESTED   Check appropriate blocks							0.0746	R/spec	city,		100	) (Q) A
Ammonia	BASE SAMPLE NUMBE	2 K	الح الم الم	- 00A	1	08HL PIS		7	٠ 4			
Residue, Settleable   School		ANAL	YSES REQUEST	ED / ch	ck appropriate blo	cks ;						
Ammonia	GROU	UPA	Hardness	აი	900	Residue, Settles	ibie				188	
Chemical Oxygen Demand   Card   Silica   Silica   Bromodichloromethane   Cardon   Tetrachlorode   Silica   Si	Ammonta		Iron			Residue, Volatil	l e			Bromo	om	
Magnesium   Magnesium   Magnesium   Specific Conductance   Carbon Iterachiorose   Carbon	Chemical Oxygen Dem	and	Lead			Silica				Bromo	1.chloron	e than e
Nitrate	Kjeldahi Nitrogen		Magnesium	n.	1	Specific Conduc	ctance		$\Box$	Carbon	Tetract	lloude
Nitrite	Nitrate		Manganese	·		Sulfate				Chloro	form	
Organic Carbon         D0680         Potassium         00937         Turbidity         00076         Methylene Chloride         344/3           Orthopnosphate         00071         Selenium         01147         Tetrachloroethylene         34475           Phosphorus, Total         00605         Silver         91077         1,1,1-Trichloroethylene         34506           Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Comm	Nutrite		Mercury			Sulfite						
Orthophosphate   00671   Selenium   01147   Tetrachloroethylene   34475	Oil & Grease	)u560	Nickel		.067	Surfactants -MB				Dibros	ochloror	
Phosphorus, Total   00005   Silver   01077	Organic Carbon	)0680	Potassium	<u> </u>		Turbidity		00076		Methy	ene Chic	nae
Solution	Orthophosphate		Selenium							Tetrac	hloroeth	yiene
GROUP D	Phosphorus, Total	J0665	Silver			-			4	1,1,1-	Trichloro	ediane
Cyanide, Total   100720   Zinc   01092   Chlordane   39350   PCBs   39516			Sodium									me 40080
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Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dilismers   Dili	Cvanide, 1 >tal		Zinc		1092	Chlordane				PCBs		77010
GROUP E   GROUP G   Endrin   39390	Cyanide, Free	90722				DDT Isomers			Y	Vic	<u> </u>	- Carl/1-
Phenois   32730   Acidity, Total   70508   Heptachlor   39410			and and the bar			Dieldrin			X	An	<u>. درد</u>	5-2437
Phenois	GRO			3.94		Endrun			Ц			<del></del>
GROUP F   Alkalinity, Total   Heptachlor Epoxide   1-2   39782	Phenois	32730	Acidity, T	ota!		<del></del>			X	<u> </u>		
Antimony   Olo97   Bromide   71870   Methoxychlor   39480				, lotal	i	<del>+</del>	Kide		Н	re	KE	· 1 /
Antimony   Bromide   Methoxychlor   Arsenic   Olova   Carbon Dioxide   Olova   GRO		<b>7</b> T	,Bicarbonate 71	1870	<del></del>			Н				
Barium			<del>   </del>			<del></del>			Н			<del></del>
Beryllium	Arsenic					<del></del>			Н			
Beryllium	<del> </del>		<del></del>			<del></del>			<u> </u>			
Boron			<del></del>						⊢			<del></del>
Calcium         00916         Odor         00086          Dissolved 01/100         ngel           Chromium. Total         01034         Residue, Total         00500         pH         00400         units           Chromium VI         01032         Residue, Filterable (TDS) 70300         GROUP J         Temperature 00010         >C           Copper         01042         Residue, Nonfilterable         Sulfides         00745			<del>                                     </del>			2, 4, 5-T			_			: R.
Chromium VI 01032 Residue, Filterable (TDS) 70300 GROUP J Temperature 00010 >C  Copper 01042 / Residue, Nonfilterable Sulfides Sulfides						<b></b>						) i
Chromium VI 01032 Residue, Filterable (TDS) 70300 GROUP J Temperature 00010 C  Copper 01042 / Residue, Nonfilterable Sulfides Sulfides	<del></del>		Odor			<del> </del>			_			
Copper 01042 / Residue.Nonfilterable 00530 Sulfides 00745				rotat		1 4 1 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	CBO	n ,				Tutt
Copper Residue.Nonfilterable Sulfides	Chromium VI		171	_ 00	0530	Y			ᆫ	empera	ture	+
I COMMENTS	Copper COMMENTS		l Residue.N	ionfilterable		Sulfides			┝			<del></del>
AV = 751		1 7	751						$\vdash$			<del>                                     </del>

## **APPENDIX G**

Laboratory Data

#### G. LABORATORY DATA

### G. 1 Using the Laboratory Reports

This appendix contains all sample analytical data collected during the course of this project, in the form of original laboratory reports. All analysis reports were generated by the Acurex laboratory, and are arranged numerically by laboratory report number, which appears at the top right-hand corner of each page of data (see figure G-1).

The data are organized in the reports by analytical parameter, and are reported under the six-digit sample ID number (the leading three digits are always zeros). These parameter categories represent separate report sections: volatile aromatic organics, volatile halogenated organics, atomic absorbtion metals (As, Se, Hg), ICP metals and minerals (Ba, Cr, Cd, Pb, Zn, Fe, Ca, Mg, Mn, Na, K), alkalinity (carbonate, bicarbonate, hydroxide), total dissolved solids, anions (STD 429), total cyanide, total recoverable phenolics, and total petroleum hydrocarbons. Therefore, in order to research all data for a particular sample, the reader must refer to each parameter section which applies to the sample. Each ground water sample has one sample ID number, thus each parameter is reported using the same ID number.

To retrieve data from the reports, the reader must first determine the sample ID number for the well of interest. This may be accomplished by referring to Table G-1, which is a listing of all sample ID numbers and their corresponding well numbers. The results may then be found in the reports, along with the analysis dates, surrogate recoveries (where applicable), and method detection limits on the same page. Table G-1 lists the collection date and time for each sample, sorted by sample ID number, for computation of holding times. Table G-2 presents field chemistry data (pH, conductivity, temperature) for both sampling rounds, and is sorted by well number.

Most of the parameter data will include a "detection limit factor" for each sample. For water samples, this is a dilution factor for high-concentration analytes. The actual detection limit for a particular sample is determined by multiplying the method detection limit (in the last column of each page) by the detection limit factor.

In addition to sample results, the reports also include laboratory QA/QC sample results and second-column confirmation results. A sample type code appears above the sample ID number:

LAN - Sample analysis

MB - Method blank

LDU - Laboratory duplicate

LSP - Laboratory matrix spike

MSL - Matrix spiking level

DET - Method detection limit

LAC - 2nd column confirmation run

For volatile organic analysis results (EPA Methods 601 and 8020), all compounds reported detected at or above the method detection limit have been confirmed (except methylene chloride). Second column results are reported at the end of both VOA sections under the sample ID number, and are separate from the original sample analysis report. For compounds which were detected in the first analysis but not confirmed, the original value is reported and flagged with a footnote ("n"). Samples for which compounds are confirmed at a different concentration are reported using the first-column result.

TABLE G-1

Page 1

### MATHER PHASE II, STAGE 3 GROUND WATER SAMPLE LIST

SAMPLE	PROJECT	DATE / TIME		BORING/	STATIC	SAMPLE	AV REF
NUMBER	NUMBER	COLLECTED	SITE	WELL #	WATER LVL	TYPE	NUMBER
000601	10416L	12/08/86 13:00	WD	DH48		G	DH48G2
000602	10416L	12/08/86 14:15	WD	DH63		G	DH43G2
000603	10416L	12/08/86 15:15	WD	DH10		G	DH10G2
000604	10416L	12/08/86 16:45	WD	DH11		G	DH11G2
000605	10416L	12/09/86 07:25	WD	DH61		Ğ	DH61G2
000606	10416L	12/09/86 08:30	WD	DH62		Ğ	DH62G2
000607	10416L	12/09/86 09:35	WD	DH47		Ğ	DH47G2
000608	10416L	12/09/86 09:35	WD	DH47		GD	000607
000609	10416L	12/09/86 10:50	WD	DH60		G	DH60G2
000610	10416L	12/09/86 11:40	71	DH46		Ğ	DH46G2
000611	10416L	12/09/86 12:40	71	DH59		G	DH59G2
000612	10416L	12/09/86 15:00	WD	DH40		G	DH40G2
000613	10416L	12/09/86 16:00	71	DH55		G	DH55G2
000614	10416L	12/09/86 17:00	71	DH08		G	DH08G2
000615	10416L	12/10/86 07:45	NE	DH65		G	DH65G2
000616	10416L	12/10/86 09:45	NE	DH76		G	DH76G2
000617	10416L	12/10/86 10:20	NE	DH75		G	DH75G2
000618	10416L	12/10/86 11:15	NE	DH64		G	DH64G2
000619	10416L	12/10/86 14:00	NE	DH73		G	DH73G2
000620	10416L	12/10/86 15:00	NE	DH66		G	DH66G2
000621	10416L	12/10/86 12:50	BP	HW04		G	HW04G1
000622	10416L	12/10/86 15:35	BP	MB01		G	MB01G1
000623	10416L	12/10/86 14:35	BP	K09		G	K09G1
000624	10416L	12/10/86 13:35	BP	HW03		G	HW03G1
000625	10416L	12/10/86 15:50	BP	MB04		G G	MB04G1
000626	10416L 10416L	12/10/86 14:15	BP	HW05 HW06			HW05G1
000627 000628	10416L 10416L	12/10/86 13:20 12/10/86 12:30	BP	HW01		G G	HW06G1 HW01G1
000628	10416L	12/11/86 07:50	BP 71	DH58		G	DH58G2
000630	10416L	12/11/86 07:50	71	DH58		GD	000629
000631	10416L	12/11/86 07:50	71	DH 0 9		G	DH09G2
000632	10416L	12/11/86 09:50	71	DH42		G	DH42G2
000633	10416L	12/11/86 10:45	71	DH57		G	DH57G2
000634	10416L	12/11/86 12:45	71	DH41		Ğ	DH41G2
000635	10416L	12/11/86 13:40	71	DH56		Ğ	DH56G2
000636	10416L	12/11/86 14:20	71	DH97		GB	
000637	10416L	12/11/86 15:10	71	DH07		G	DH07G2
000638	10416L	12/11/86 16:05	71	DH43		Ğ	DH43G2
000639	10416L	12/12/86 07:15	71	DH 4 4		Ğ	DH44G2
000640	10416L	12/12/86 09:15	71	DH45		G	DH45G2
000641	10416L	12/12/86 09:15	71	DH45		GD	000640
000642	10416L	12/12/86 10:45	NE	DH49		G	DH49G2
000643	10416L	12/12/86 12:15	ACW	DH70		G	DH70G2
000644	10416L	12/12/86 12:45	ACW	DH52		G	DH52G2
000645	10416L	12/12/86 14:30	ACW	DH53		G	DH53G2
000646	10416L	12/12/86 16:00	ACW	DH71		G	DH71G2
000647	10416L	12/12/86 15:00	BP	AC01		G	AC01G1
000648	10416L	12/12/86 15:35	BP	JT01		G	JT01G1
000649	10416L	12/13/86 07:30	ACW	DH54		G	DH54G2
000650	10416L	12/13/86 09:05	ACW	DH72		G	DH72G2

## MATHER PHASE II, STAGE 3 GROUND WATER SAMPLE LIST

SAMPLE	PROJECT	DATE / TIME		BORING/	STATIC	SAMPLE	AV REF
NUMBER	NUMBER	COLLECTED	SITE	WELL #	WATER LVL	TYPE	NUMBER
000651	10416L	12/13/86 10:00	ACW	DH50		G	DH50G2
000652	10416L	12/13/86 10:20	ACW	DH50		GD	000651
000653	10416L	12/13/86 11:00	ACW	DH51		G	DH51G2
000654	10416L	12/13/86 12:20	ACW	DH69		Ğ	DH69G2
000655	10416L	12/13/86 14:25	ACW	DH68		Ğ	DH68G2
000656	10416L	12/13/86 15:00	ACW	DH01		Ğ	DH01G2
000657	10416L	12/13/86 15:40	ACW	DH67		G	DH67G2
000658	10416L	12/14/86 08:10	ACW	DH02		G	DH02G2
000659	10416L	12/14/86 08:10	ACW	DH02		GD	000658
000660	10416L	12/14/86 07:50	ACW	DH85		GB	
000661	10416L	12/14/86 08:55	ACW	DH03		G	DH03G2
000751	10416L	11/10/86 11:30	ACW	DH51		G	DH51G1
000752	10416L	11/10/86 15:00	ACW	DH52		G	DH52G1
000753	10416L	11/18/86 09:00	ACW	DH70		G	DH70G1
000754	10416L	11/11/86 11:00	ACW	DH53		G	DH53G1
000755	10416L	11/11/86 12:30	ACW	DH71		G	D#71G1
000756	10416L	11/11/86 15:10	ACW	DH54		G	DM54G1
000757 000758	10416L 10416L	11/11/86 16:30	ACW	DH72 DH03		G G	DH72G1
000758	10416L	11/11/86 17:30 11/12/86 09:30	ACW ACW	DH03		G	DH03G1 DH67G1
000759	10416L	11/12/86 09:30	ACW	DH67		G	DH68G1
000761	10416L	11/12/86 13:10	ACW	DH01		G	DH01G1
000762	10416L	11/12/86 13:10	ACW	DH01		GD	000761
000763	10416L	11/12/86 15:15	ACW	DH50		G	DH50G1
000764	10416L	11/12/86 16:45	ACW	DH02		Ğ	DH02G1
000765	10416L	11/13/86 09:30	ACW	DH69		Ğ	DH69G1
000766	10416L	11/13/86 11:00	WD	DH63		Ğ	DH63G1
000767	10416L	11/13/86 12:50	WD	DH48		G	DH48G1
000768	10416L	11/13/86 14:50	WD	DH11		G	DH11G1
000769	10416L	11/13/86 16:45	WD	DH61		G	DH61G1
000770	10416L	11/13/86 16:45	WD	DH61		GD	000769
000771	10416L	11/14/86 08:15	WD	DH10		G	DH10G1
000772	10416L	11/14/86 09:15	WD			GB	
000773	10416L	11/14/86 11:00	WD	DH47		G	DH47G1
000774	10416L	11/14/86 12:30	WD	DH60		G	DH60G1
000775	10416L	11/14/86 14:10	NE	DH64		G	DH64G1
000776	10416L	11/14/86 15:40	NE	DH76		G	DH76G1
000777	10416L	11/14/86 16:45	WD	DH62		G	DH62G1
000778	10416L	11/15/86 10:35	NE	DH75		G	DH75G1
000779	10416L 10416L	11/15/86 12:00	NE	DH65		G	DH65G1
000780 000781	10416L 10416L	11/15/86 14:20	NE	DH73		G	DH73G1
000781	10416L	11/15/86 16:15 11/15/86 17:45	NE	DH66		G G	DH66G1 DH49G1
000783	10416L 10416L	11/15/86 17:45	WD 71	DH49 DH45		G	DH49G1 DH45G1
000785	10416L	11/16/86 10:30	71	DH45		G	DH45G1
000786	10416L	11/16/86 11:45	71	DH40		G	DH40G1 DH59G1
000787	10416L	11/16/86 15:45	71	DH08		G	DH08G1
000788	10416L	11/16/86 16:10	71	DH58		G	DH58G1
000789	10416L	11/16/86 17:15	71	DH09		Ğ	DH09G1
000790	10416L	11/17/86 11:15	71	DH43		Ğ	DH43G1

### MATHER PHASE II, STAGE 3 GROUND WATER SAMPLE LIST

SAMPLE NUMBER	PROJECT NUMBER	DATE / TIME COLLECTED	SITE	BORING/ WELL #	STATIC WATER LVL	SAMPLE TYPE	AV REF NUMBER
000791	10416L	11/17/86 11:15	71	DH43		GD	000790
000792	10416L	11/17/86 12:45	71	DH07		G	DH07G1
000793	10416L	11/17/86 13:45	71	DH44		G	DH44G1
000794	10416L	11/17/86 15:30	71	DH55		G	DH55G1
000795	10416L	11/17/86 16:15	71	DH40		G	DH40G1
000796	10416L	11/18/86 09:30	71	DH42		G	DH42G1
000797	10416L	11/18/86 10:45	71	DH57		G	DH57G1
000798	10416L	11/18/86 11:30	71	DH41		G	DH41G1
000799	10416L	11/18/86 11:30	71	DH41		GD	000798
00800	10416L	11/18/86 12:45	71	DH56		G	DH56G1
000801	10416L	11/18/86 13:20	71			GB	

SITE CODES: ACW - AC&W AREA

WD - WEST DITCH 71 - 7100 LANDFILL

NE - NORTHEAST PERIMETER BP - BASE PRODUCTION WELL

SAMPLE TYPES:

G - GROUND WATER SAMPLE

GD - FIELD DUPLICATE GROUND WATER SAMPLE

GB - FIELD BLANK SAMPLE

AV REFERENCE NUMBER:

DH G1 - FIRST ROUND MONITOR WELL SAMPLE DH G2 - SECOND ROUND MONITOR WELL SAMPLE

HW G1 - HOUSING WELL SAMPLE

MB G1 - MAIN BASE PRODUCTION WELL SAMPLE

 $K\overline{09}G1 - K-9$  PRODUCTION WELL

JT01G1 - JET TEST CELL PRODUCTION WELL AC01G1 - AC&W PRODUCTION WELL

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2.	<i>-</i> -					<b>~</b>	- 01	۰				_			_		<b>.</b>
zed Temp?	. ~	20.7 18.0	81 181 181 181 181 181	20.3 20.3 20.8	19.3 18.1 18.9	20.6	21.2	20.4	21.6	9.61	19.4	2.0	20.1	21.6	707	7.7	<u> </u>
Stabilized Cond2 Temp2	200 N/A	740 780 250	230 155 275	610 610 810	400 260 210	150	220 150	170	150 195 150	190	260 200	115	145 170	150 210	160 145	145 190	200
St Ph2 (	6.87 N/A	6.82 6.73 7.46	6.96 7.71 6.81	7.20 5.14 N/A	N/A 7.99 7.96	7.80 5.98	9.00 7.59	7.16	7.85 3.75 7.84	4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	N/A 9.99 9.14	7.71 N/A	3.02 5.73	7.63	7.71	7.24	3.83 7.68
2 1p1	6925	6 -		റനമായ	285	ω <b>4</b> -	- 9 2	8 7	202	<b>0</b> m -	- o c	10 m	ec m	MΘ	~ 57	- S-	_ ~
D al Temp																	
O U N Initia Condi	195 380 200 870	850 805 260	255 140 380	155 155 610 475	400 260 230	190 245 210	220 220 150	150	240 300 200	160	250 250 210	180	145 180	150 150	140 140	200	140 150
R Ph1	7.50 7.37 N/A	6.86 6.86 7.15	6.94 0.70 7.95	6.90 6.94 6.94	N/A 8.07 9.26	8.10 8.48	9.10 8.38	8.18 10.3	9.88 9.88 9.16	N/A 9.78	10.0	9.80 N/A	9.30	8.36 8.29	9.05	8.61 6.84	9.53
Ref	OHO 1G2 OHO 2G2 OHO 3G2	0H09G2	OH1162 OH4062 OH4162	DH4 3G2 DH4 4G2 DH4 4G2	DH46G2 DH47G2 DH48G2	DH49G2 DH50G2	0H52G2	4G2 5G2	DH57G2 DH57G2 DH58G2	962	OH6 2G2 OH6 3G2	OH64G2 OH65G2	OH66G2 OH67G2	8G2 9G2	0H70G2	2G2 4G2	)H75G2 )H76G2
Av Ref Number	DH01G2 DH02G2 DH03G2	DH08G2 DH09G2 DH10G2	DH11G2 DH40G2 DH41G2	2 4 4 5 4 4 4 4	DH DH 2	OHS	DH52G2	DH54G2 DH55G2	555	DH59G2 DH60G2	DH62G2 DH63G2	9HG	9H2	DH68G2 DH69G2	DH70G2	DH72G2 DH73G2	DH7
Sample Number	000656 000658 000661	000614 000631 000603	000604 000612 000634	000638 000638 000639	000610 000607 000601	000642	000644	000649	000635 000633 000629	0000611	000606	000618	000620	000655	000643	00650	00617
															_ "		00
zed Temp2	19.4 N/A 18.4			19.6 19.6 19.1	19.1 19.3 19.3	18.9	. 🔪 .		19.5		19.1 N/N 19.6			19.1 19.0			19.4 19.4
Stabilized Cond2 Tem	220 N/A 174	1050 340 295	290 175 280	175 175 610 8/A	470 320 210	190	300 160	190	210 225 200	225	200 200	164	174 171	171 176	155 155	180	275 230
sta Ph2 Co	N/A 63	7.10 6.70 7.46	د. 4.0 ف	6.10 5.80 <b>N/A</b>	43.6	67	5.0	85	7.60 8.05 7.8	10	5 4 4 4 4 4	71 85	85 64	2 <b>4</b> 93	93 06	.07	64
<b>-</b>			., 6.	ີ້໙໋໐໋			; ₆ ′.	٠, ٣,	. 96 /	. B	. ~ ~	7.	œ. œ.	<b>დ</b> . დ	. A	œ æ	2.
D .1 Тещр1	N/A N/A 18.5		17.9 18.5 18.6				. 66	20.3	19.2 19.2 19.0	19.4	18.3		18.5 17.6	19.4 19.9	18.9 20.4	20.1	17.6
O U N D Initial Condl T	200 N/A 200 775	1050 128 275	250 190 440	250 620 550	470 350 350	310	280	255	460 950 330	330	440 740	340	340 375	200 1 <b>4</b> 3	255 190	310 225	260 250
- R (	7.91 N/A 9.12 6.19		7.80	. 02	7.2 5.58 9.02	7.52	67	3.75	90.40	N/A	S X 4	10.0	10.8 3.62	3.62	3.51 9.09	ლ.	
<u></u>																	<b>-</b>
Av Ref Number	DH01G1 DH02G1 DH03G1	DH08G1 DH09G1 DH10G1	DH11G1 DH40G1 DH41G1	DH43G1 DH44G1 DH45G1	DH46G1 DH47G1 DH48G1	DH49G1 DH50G1	DH5261	DH54G1 DH55G1	DH5761 DH5761 DH5861	DH59G1	DH62G1	DH64G1 DH65G1	DH66G1 DH67G1	DH68G1 DH69G1	DH70G	DH72G DH73G	DH75G DH76G
Sample	000761 000764 000758 000792	0787 0789 0771	000768 000795 000798	0790 0793 0784	0785 0773 0767	0783	000752	000756	000797 000797 000788	000774	000777	0000775	0781 0759	000760	0753 0755	000757	000778 000776
	8888	888	0000		888	888	888	000	383	888		000	88	88	88	88	00
Boring/ Well #	DH01 DH02 DH03 DH07	DH08 DH09 DH10	0H4 0H4 15	DH43 PH45 PH45 PH45 PH45 PH45 PH45 PH45 PH45	0H46 DH47 DH48	DH49 DH50	DH52 DH53	DH54	DH56	DH60	DH62	DH64 DH65	DH66 DH67	DH69	DH70 DH71	DH72 DH73	DH75 DH76
	33 33 A	C-B	8	• • •	<u>- 6</u> 6	<u> 23</u> 33 33	<b>, z</b> z	<b>Z</b> ~ -		<b>≒8</b> €		E E	S NE	<b>3</b> 3	Z, Z	NE NE	년 <b>년</b>
Site	ACK ACK	アトス	<b>₹</b> ₹₹		<b>~ ₹ ₹</b>	<b>3</b>	Y O	AC 7	11.	~ 3 <b>3</b> 5	<b>3</b> 3 3	ZZ	N O	ACE ACE	YC. YC.	AC	ZZ
Project Number	10416L 10416L 10416L 10416L	10416L 10416L 10416L	10416L 10416L 10416L	10416L 10416L 10416L	10416L 10416L 10416L	10416E 10416E 10416E	10416L 10416L	10416L 10416L	10416L 10416L 10416L	10416L 10416L	10416L 10416L 10416L	10416L 10416L	10416L 10416L	10416E 10416E	10416L 10416L	10416L 10416L	10416L 10416L

# FIGURE G-1 TYPICAL LAB REPORT

				Lat	Report Nu	ımber
					•	rovirinten
						11-147 le 67:1147
			Pai	ameter	•	.e c+.
	Sample Type Code	Table 1.	Analysis Ty	pe: 601 Res	ults	
	Sample ID Number					
	Sample Type:	LAN	LAN	LAN	LAN	DE T
	Sample ID#:	000771	000772	000773	000774	990000
	Compound		Concen	tration ug/	L	
	Chloromethane	ND	ND	ND	ND	
	Bromomethane	ND	ND	ND	ND	6.5
	4 Dichlorodifluoromethane	ND	ND	ND	ND	9.5
	4 Vinyl Chloride	ND	ND	ND	ND	2.5
	Chloroethane	ND	ND	ND	ND	0.5
	Methylene Chloride	8.9 a	9.9	0.7 a	8.0 a	2.5
	Trichlorofluoromethane	ND .	ND	מא	an	5.5
	_	ND	ND	1.3	מא	9.5
	1,1-Dichloroethene	_	_	2.4	ND	0.5
	1,1-Dichloroethane	ND	ND ND			
	trans-1,2-Dichloroethene	ND	מא	5.2 n	ND	).5
	Chloroform	ND	4.2	N D	ND	0.5
	1,2-Dichloroethane	DN	ND	ND	ND	ે. 5
	1,1,1-Trichloroethane	ND	1.0 n	ND	ND	ે.5
O	Carbon Tetrachloride	ND	ND	ND	ND	0.5
Compound	Bromodichloromethane	ND	ND	ND	ND	≎.5
not confirmed	1,2-Dichloropropane	מא	В	ND	ND	5.5
by 2nd column		ND	ND	ND	ND	. 5
-	Trichloroethene	ND	ND	7.6	ND	. 5
	1 Dibromochloromethane	ND	аи	ND	ND	1,5
	1 1,1,2 Truchloroethane	ND	ND	ND	N D	:.5
	1 cis-1,3-Dichloropropens	ND	ND	ND	ND	1.5
		ND	מא	ND	ND	
	2-Chloroethylvinylether				ND	0.5
	Bromoform	ND	ND	ND		. 5
	2 1,1,2,2-Tetrachloroethane	ND	ND.	2.5 n	) ND	
	2 Tetrachloroethene	ND	ND	2.5	ND	0.5
	Chlorobenzene	МÐ	ND	GM	ND	>.5
	3 Dichloropenzenes	ND	ND	ND	ND	3.5
				_		
	Multiply detection limit	actor by me	ethod detec	tion limit	to determin	ne actual
	sample detection limit					
	Detection limit factor:	1.00	1.00	1.00	1.00	
	Surrogate Recovery %:	104	110	58	76	
	Analysis date:	11/19/86	11/19/86	11/12/86	11/18/86	
	<ul> <li>1 - these compounds coelut</li> <li>2 - these compounds coelut</li> <li>3 - mixture of isomers and</li> <li>4 - these compounds coelut</li> </ul>	e a-be coelute	ot detected low normal	laboratory	background :	es factor levels



Energy & Environmental Division

Aerovironment 225 Myrtle Ave. Monrovia, Ca 91016 November 24, 1986 Acurex ID#: 8611~030 File 6021130A

Attention: Chris Lovdahl

Subject: Analysis of Eight Water Samples

for Volatile Aromatic Organics, Received 11/12/86

Eight water samples were analyzed for volatile aromatic organics according to EPA Method 8020 (Test Methods for Evaluating Solid Waste ~ SW846, 2nd Ed., 1982). Results are presented in Table 1. Quality assurance data is presented in Table 2. The method can be summarized as follows:

Helium is bubbled through a volume of water contained in a specially designed purging chamber at ambient temperature. The purgeable aromatic compounds are efficiently transferred from the aqueous phase to the vapor phase. The vapor is swept through a sortent column where the purgeables are trapped. After purging is complete, the sorbent column is heated and back flushed with helium to desorb the purgeables onto a gas chromatographic column. The gas enromatograph is temperature programmed to separate the purgeables which are then detected with a photoionization detector (PID) run in series with a Hall detector. SP-1000 on Carbopak B is used for the primary analysis. Confirmations are run using a PID alone and a column containing SP-1200 on Bentone-34.

If you should have any questions, please do not hesitate to call.

Submitted by: Sub other

1

Sarah Schoen, Ph.D. Staff Chemist Greg Micoli Project Chemist

These results were obtained by following standard laboratory procedures: the liability of Acurex Corporation whall not exceed the amount paid for this report. In no event shall Acurex be liable or special or consequential damages.

Table i. Analysis Type: 8020 Results

Sample Type: Sample ID#:	LAN 000751	LAN 000752	LAN 000753	LAN 0007 <b>54</b>	DET 9 <b>9</b> 9999				
Compound	Concentration ug/L								
Benzene	ND	ND	ND	0.6 n	0.5				
Chlorobenzene	ND	ND	ND	ND	).5				
1,2-Dichlorobenzene	ND	ND	ND	ND	ψ.5				
1,3-Dichlorobenzene	ND	ND	NO	ND	ે.5				
1,4-Dichlorobenzene	ND	ND	ND	ND	0.5				
Ethylbenzene	ND	ND	ND	ND	0.5				
Toluene	ND	ND	ND	2.1	1.0				
Total Xylenes	ND	ND	סא	ND	2.0				
Detection limit factor:	1	1	1	1					
Surrogate Recovery %:	83	103	62	81					
Analysis date:	11/14/86	11/17/86	11/14/86	11/14/86					

Table 1. Analysis Type: 8020 Results (continued)

Sample Type: Sample ID#:	LAN 0007 <b>55</b>	LAN 000756	LAN 000757	LAN 000753	DET 900000
Compound		Conc	entration ug	/L	
Benzene	ND	ND	1.7 n	NĒ	
Chlorobenzene	ND	ND	ND	ND	. 5
1,2-Dichlorobenzene	ND	ND	ND	NB	6.5
1,3-Dichlorobenzene	ND	ND	ND	ND	ં.5
1,4-Dichlorobenzene	N D	ND	ND	NE	. 5
Ethylbenzene	5.0	ND	ND	ND	0.5
Toluene	42	ND	ND	ND	1.0
Total Xylenes	23	DM	ND	NB	2.0
Detection limit factor:	1	1	1	50	
Surrogate Recovery %:	96	86	76	127	
Analysis date:	11/17/86	11/24/86	11/14/86	11/17/85	

Table 2. Analysis Type: 8020 QA

Sample Type: Sample ID#:	MB1 999998	MB2 999998	MB3 999998	SB1 999998	DET 999999
Compound		g/L			
Benzene	ND	ND	ND	ND	9.5
Chlorobenzene	ND	ND	ND	ND	9.5
1,2-Dichlorobenzene	ND	ND	ND	ND	0.5
1,3-Dichlorobenzene	ND	ND	ND	N D	0.5
1,4-Dichlorobenzene	ND	ND	ND	ND	1.5
Ethylbenzene	ND	ND	ПN	ND	0.5
Toluene	ND	ND	ND	ND	1.0
Total Xylenes	ND	ND	ND	ND	2.0
Detection limit factor:	1	1	1	1	
Surrogate Recovery %:	NS	63	68	104	
Analysis date:	11/14/86	11/17/86	11/24/86	11/14/86	

NS - not spiked



**Energy & Environmental Division** 

Aerovironment 825 Myrtle Ave. Monrovia, Ca 91016 November 25. 1986 Acurex ID#: 8611-037 File 6021137A

Attention: Chris Lovdahl

Subject: Analysis of Six Water Samples

for Volatile Aromatic Organics, Received 11/13/86

Six water samples were analyzed for volatile aromatic organics according to EPA Method 8020 (Test Methods for Evaluating Solid Waste ~ SW846, 2nd Ed., 1982). Results are presented in Table 1. Quality assurance data is presented in Table 2. The method can be summarized as follows:

helium is bubbled through a volume of water contained in a specially designed purging chamber at ambient temperature. The purgeable aromatic compounds are efficiently transferred from the aqueous phase to the vapor phase. The vapor is swept through a sorbent column where the purgeables are trapped. After purging is complete, the sorbent column is heated and back flushed with helium to desorb the purgeables onto a gas chromatographic column. The gas chromatograph is temperature programmed to separate the purgeables which are then detected with a photoionization detector (PID) run in series with a Hall detector. SP-1000 on Carbopak B is used for the primary analysis. Confirmations are run using a PID alone and a column containing SP-1200 on Bentone-34.

If you should have any questions, please do not hesitate to call.

Submitted by: Jaroh Jahr

arah Schoen, Ph.D.

Staff Chemist

Greg Nicoll Project Chemist

These results were obtained by following standard laboratory procedures; the liability of Acurex Corporation shall not exceed the amount paid for this report. In no event shall Acurex be liable for special or consequential damages.

Table 1. Analysis Type: 8020 Results

Sample Type: Sample ID#:	LAN 000759	LAN 000760	LAN 000761	LAN 000762	DET 699955				
Compound	Concentration ug/L								
Benzene	1.2 п	1.7 n	ND	ND	0.5				
Chlorobenzene	ND	ND	ND	ND	0.5				
1,2-Dichlorobenzene	ND	ND	ND	ND	0.5				
1,3-Dichlorobenzene	ND	ND	ND	ND	9.5				
1,4-Dichlorobenzene	ND	ND	ND	ND	0.5				
Ethylbenzene	ND	ND	ND	ND	0.5				
Toluene	ND	ND	ND	ND	1.0				
Total Xylenes	ND	5	ND	ND	2.9				
Detection limit factor:	1	1	10	10					
Surrogate Recovery %:	80	74	99	103					
Analysis date:	11/14/86	11/14/86	11/17/86	11/17/86					

Table 1. Analysis Type: 8020 Results (continued)

Sample Type: Sample ID#:	<del>-</del> · · ·	LAN 000764	DET 999999
Compound	Cana	entration up	]/L
Benzene	ND	ND	0.5
Chlorobenzene	ND	ND	0.5
1,2-Dichlorobenzene	ND	ND	0.5
1,3-Dichlorobenzene	ND	ND	0.5
1,4-Dichlorobenzene	ND	ND	0.5
Ethylbenzene	ND	ND	0.5
Toluene	ND	ND	1.0
Total Xylenes	ND	ND	2.0
Detection limit factor:	1	5	
Surrogate Recovery %:	98	107	
Analysis date:	11/17/86	11/17/86	

Table 2. Analysis Type: 8020 QA

Sample Type: Sample IE#:	MB1 799998	MB2 999998	581 999998	LDU 000764	DET 999999				
Compound	Concentration ug/L								
Benzene	ND	ND	ND	ND	0.5				
Chloropenzene	ND	ND	ND	ND	9.5				
1,2-Dichlorobenzene	ND	ND	ND	ND	0.5				
1.I-Dichlorobenzene	ND	ND	ND	ND	∴.5				
1,4-Dichlorobenzene	ND	ND	ND	ND	0.5				
Ethylbenzene	ND	ND	ND	ND	).5				
Toluene	ND	ND	ND	ND	1.0				
Total Xvienes	ND	ND	ND	ND	2.9				
Detection limit factor:	1	1	1	1					
Surrogate Recovery %:	NS	63	99	7 4					
Analysis date:	11/14/86	11/17/86	11/17/86	11/18/86					

NS - not spiked



### Energy & Environmental Division

Aardvindhment F23 Tyrole Ave. monreysa, 54 F1016 December 4, 1935 Acure: ID#: 8511-046 File 6021140A

Atlantion: Caris Loydahl

Subject: Analysis of Six Water Samples for volatile Aromatic Organics, Received 11/14/86

uid vater samples were analyzed for volatile aromatic organics according to ECA method 8020 (Test Methods for Evaluating Solid Waste - 5W646, Ind Ed., 1982). Results are presented in Table 1. Quality assurance data is presented to Table 1. The method can be summarized as follows:

Helium is bubbled through a volume of water contained in a specially designed purging chamber at ambient temperature. The purgeable aromatic compounds are efficiently transferred from the adjects phase to the vapor phase. The vapor is swept through a sorder to column where the purgeables are trapped. After purging is complete, the sorbent column is heated and back flushed with helium to desorute surgeables onto a gas chromatographic column. The gas chromatograph is temperature programmed to separate the purgeables which are then detected with a photoionization detector (PID) run in series with a Hall detector. SP-1000 on Carbopak B is used for the primary analysis. Confirmations are run using a PID alone and a column containing SP-1200 on Pentone-74.

.. you should have any questions, please do not hesitate to call.

Submitted by: Sand Schoen, Ph.D.

Staff Chemist

Greg Nicoli

These results were obtained by following standard laboratory procedures: the mainlify of Adurex Corporation shall not exceed the amount paid for this report. It as event shall Adurex be liable for special or consequential damages.

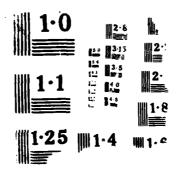
Table 1. Analysis Type: 8020 Results

Sample Type: Sample ID#:	LA <b>N</b> 0007 <b>65</b>	LAN 000766	LAN 000767	LAN 000768	DE T				
Compound	Concentration ug/L								
Benzene	N D	ND	N D	NB	: . 5				
Chlorobenzene	ND	МÐ	ND	ΝE	:, 5				
1,2-Dichlorobenzene	ND	ND	ND	ND	:. =				
1,3-Dichlorobenzene	ND	ПN	ND	CM	9.5				
1,4-Dichlorobenzene	ND	ND	ND	ND					
Ethylbenzene	ND	ND	מא	ND	્ર. દ				
Toluene	ND	ND	ND	ND	1				
Total Xvlenes	ΝD	ND	ND	ND	<b>-</b> . :				
Detection limit factor:	1.00	1.00	1.00	1.00					
Surrogate Recovery %:	106	87	7 4	112					
Analysis date:	11/17/86	11/17/86	11/18/86	11/18/86					

Table 1. Analysis Type: 8020 Results (continued)

Sample Type: Sample ID#:	LAN 000769	LAN 000770	DET 999999		
Compound	Concentration ug/L				
Benzene Chlorobenzene 1,2-Dichlorobenzene 1,3-Dichlorobenzene 1,4-Dichlorobenzene Ethylbenzene Toluene Total Xylenes	ND ND ND ND ND ND	00 00 00 00 00 00 00	0.5 0.5 0.5 0.5 0.5 0.5		
Detection limit factor: Surrogate Recovery %:	1.00	1.00 8 <b>9</b>			
Analysis date:	11/18/86	11/18/86			

5/10 UNCLASSIFIED F/G 24/4



Aerovironment 8611~040 File 6021140A

Table 2. Analysis Type: 8020 QA

Sample Type: Sample ID#:	MB1 999998	MB2 999998	SB1 999998	LDU 000766	DET 999999		
Compound	Concentration ug/L						
Benzene	ND	ND	ND	ND	0.5		
Chlorobenzene	ND	ND	ND	ND ND	0.5 0.5		
1,2-Dichlorobenzene	ND	ND	ND ND	ND	0.5		
1,3-Dichlorobenzene	ND ND	D D D	ND	ND	0.5		
1,4-Dichlorobenzene	N D N D	ND ND	ND ND	מא	0.5		
Ethylbenzene	dn dn	ND	ND	ND	1.0		
Toluene Total Xylenes	ND	ND	ND	ND	2.0		
Detection limit factor:	1.00	1.00	1.00	1.00			
Surrogate Recovery %:	106	87	74	112			
Analysis date:	11/17/86	11/17/86	11/18/86	11/18/86			

Table 2. Analysis Type: 8020 QA (continued)

Sample Type: Sample ID#:	LSP 000767	MSL 000767		DET 999 <b>9</b> 99	
Compound	Concentration			u g	/L
Benzene Chlorobenzene 1,2-Dichlorobenzene 1,3-Dichlorobenzene	100 98 110 120	% %	5 5	5 5 5	0.5
1,4-Dichlorobenzene Ethylbenzene Toluene Total Xylenes	110 98 99 83	% % %	5	5 5	0.5 0.5 1.0 2.0
Detection limit factor: Surrogate Recovery %:	1.00		1.00		

Analysis date: 11/18/86 11/18/86

ND - not detected at detection limit times factor

% - percent recovery from spiked sample

s - amount spiked in sample



## **Energy & Environmental Division**

Aerovironment 825 Myrtle Ave. Monrovia, Ca 91016 December 4, 1986 Acurex ID#: 8611-043 File 6021143A

Attention: Chris Lovdahl

Cobject: Analysis of Seven Water Samples

for Volatile Aromatic Organics, Received 11/15/86

Seven water samples were analyzed for volatile aromatic organics according to EPA Method 8020 (Test Nethods for Evaluating Solid Waste ~ SW846, 2nd Ed., 1982). Results are presented in Table 1. Quality assurance data is presented to Table 2. The method can be summarized as follows:

Helium is bubbled through a volume of water contained in a specially designed purging chamber at ambient temperature. The purgeable aromatic compounds are efficiently transferred from the aqueous phase to the vapor phase. The vapor is swept through a sorbent column where the purgeables are trapped. After purging is complete, the sorbent column is heated and back flushed with helium to desorbe the purgeables onto a gas chromatographic column. The gas chromatograph is temperature programmed to separate the purgeables which are then detected with a photoionization detector (PID) run in Beries with a Hall detector. SP-1000 on Carbopak B is used for the primary analysis. Confirmations are run using a PID alone and a column containing SP-1200 on Bentone-34.

If you should have any questions, please do not hesitate to call.

Submitted by:

Sarah Schoen, Ph.D.

Staff Chemist

Greg Nicoll

Project Chemist

These results were obtained by following standard laboratory procedures; the liability of Acure. Corporation shall not exceed the amount paid for this report. In no event shall Acurex be liable for special or consequential damages.

Aerovinonment 8611-047 File 60211474

Table 1. Analysis Type: 8020 Results

Sample Type: Sample ID#:	LAN 000771	LAN 000772	LAN 000773	LAN 000774	DET 399999	
Compound	Concentration ug/L					
Benzene	ND	ND	ND	1.2 a	0.5	
Unlorobenzene	ND	ND	ND	ND	ુ.દ	
1.2-Dichiorobenzene	ND	ND	ND	ND	0.5	
1.3-Dichlorobenzene	ND	ND	ND	ND	0.5	
1.4-Dichlorobenzene	ND	ND	ND	ND	0.5	
Ethylbenzene	ND	ND	ND	ND	0.5	
Toluene	ND	ND	ND	6.7	1.0	
Total Xylenes	ND	ND	ND	ND	2.0	
Detection limit factor:	1.00	1.00	1.00	1.00		
Surrogate Recovery %:	104	110	58	76		
Analysis date:	11/19/86	11/19/86	11/18/86	11/18/86		

ND - not detected at detection limit times factor

n - not found in confirmation run

Aerovintotent 3611-047 File 6021147A

Table 1. Analysis Type: 8020 Results (continued)

Sample Type: Sample ID#:	LAN 000775	LAN 000776	LAN 000777	DET 999999
Compound		/L		
Benzene	ND	GN	ND	0.5
Chlorobenzene	ND	ND	ND	0.5
1,2-Dichlorobenzene	ND	ND	ND	0.5
1,3-Dichlorobenzene	ND	ND	ND	0.5
1,4-Dichlorobenzene	ND	ND	ND	Ů.5
Ethylbenzene	ND	ND	ND	0.5
Toluene	ND	ND	ND	1.0
Total Xylenes	ND	ND	ND	2.0
Detection limit factor:	1.00	1.00	1.00	
Surrogate Recovery %:	89	79	81	
Analysis date:	11/19/86	11/19/86	11/19/86	

Aerovironment 8611-043 File ±021147A

Table 2. Analysis Type: 8020 QA

Sample Type: Sample ID#:	M&1 999998	MB2 999998	SB1 999998	LDU 00077 <b>4</b>	DET 999999		
Compound	Concentration ug/L						
Benzene	ND	ND	ND	1.5 n	0.5		
Chlorobenzene	ND	ND	ND	ND	0.5		
1,2-Dichlorobenzene	ND	ND	ND	ND	0.5		
1,3-Dichlorobenzene	ND	ND	ND	ND	0.5		
1.4-Dichlorobenzene	ND	ND	ND	ND	0.5		
Ethylbenzene	ND	ND	ND	ND	0.5		
Toluene	ND	ND	ND	10	1.0		
Total Xylenes	ND	ND	ND	ND	2.0		
Detection limit factor:	1.00	1.00	1.00	1.00			
Surrogate Recovery %:	84	73	61	79			
Analysis date:	11/18/86	11/19/86	11/19/86	11/19/86			

 $\mbox{ND}$  — not detected at detection limit times factor  $\mbox{\bf n}$  — not confirmed



**Energy & Environmental Division** 

Aerovironment 825 Myrtle Ave. Monrovia, Ca 91015 December 5, 1986 Acurex ID#: 8611-044 File 6021140A

Attention: Thris Lovdani

Subject: Analysis of Eleven Water Samples

for Volatile Aromatic Organics, Received 11/17/86

Eleven water samples were analyzed for volatile aromatic organics according to EPA Method 8020 (Test Methods for Evaluating Solid Waste - SW846, 2nd Ed., 1982). Results are presented in Table 1. Quality assurance data is presented in Table 2. The method can be summarized as follows:

Helium is bubbled through a volume of water contained in a specially designed purging chamber at ambient temperature. The purgeable aromatic compounds are efficiently transferred from the aqueous phase to the vapor phase. The vapor is swept through a sorbent column where the purgeables are trapped. After purging is complete, the sorbent column is heated and back flushed with helium to desorb the purgeables onto a gas chromatographic column. The gas chromatograph is temperature programmed to separate the purgeables which are then detected with a photoionization detector (PID) run in series with a Hall detector. SP-1000 on Carbopak B is used for the primary analysis. Confirmations are run using a PID alone and a column containing SP-1200 on Bentone-34.

If you should have any questions, please do not hesitate to call.

Supmitted by:

Sarah Schoen, Ph.D.

Staff Chemist

Greg Nycoli

Project Chemist

These results were obtained by following standard laboratory procedures; the liability of Acurex Corporation shall not exceed the amount paid for this report. In no event shall Acurex be liable for special or consequential damages.

Aerovironment 8611-044 File 6021140A

Table 1. Analysis Type: 8020 Results

Sample Type: Sample ID#:	LAN 000778	LAN 000779	LAN 000780	LAN 000781	DE T 999999	
Compound		Conc	ncentration ug/L			
Benzene	ND	ND	ND	ND	∘.5	
Chlorobenzene	ND	ND	ND	ND	0.5	
1,2-Dichlorobenzene	NÐ	ND	ND	ND	0.5	
1,3-Dichlorobenzene	ND	ND	ND	ND	0.5	
1,4-Dichlorobenzene	ND	ND	ND	ND	0.5	
Ethylbenzene	ND	ND	ND	ND	0.5	
Toluene	ND	ND	ND	ND	1.0	
Total Xylenes	ND	ND	ND	ND	2.0	
Detection limit factor:	1.00	1.00	1.00	1.00		
Surrogate Recovery %:	101	74	92	93		
Analysis date:	11/19/86	11/19/86	11/19/86	11/19/86		

Table 1. Analysis Type: 8020 Results (continued)

Sample Type: Sample ID#:	LAN 000783	LAN 000784	LAN 000785	LAN 000786	DET 999999		
Compound	Concentration ug/L						
Benzene	ND	ND	0.9	ND	0.5		
Chlorobenzene	ND	ND	ND	ND	0.5		
1,2-Dichlorobenzene	ND	ND	ND	ND	0.5		
1,3-Dichlorobenzene	ND	ND	ND	ND	0.5		
1,4-Dichlorobenzene	ND	ND	ND	ND	0.5		
Ethylbenzene	ND	ND	ND	ND	0.5		
Toluene	ND	ND	7.8	2.0	1.0		
Total Xylenes	ND	ND	4.0	ND	2.0		
Detection limit factor:	1.00	1.00	1.00	1.00			
Surrogate Recovery %:	82	85	91	72			
Analysis date:	11/19/86	11/20/86	11/20/86	11/20/86			

Table 1. Analysis Type: 8020 kesults (continued)

Sample Type: Sample ID#:	LAN 000787	LAN 000788	LAN 0 <b>0</b> 07 <b>89</b>	DET 999999
Campound		Concentra	ation ug/L	
Benzene	1.0	ND	6.7 n	0.5
Chlorobenzene	0.7	ND	ND	0.5
1,2-Dichlarobenzene	ND	ND	ND	0.5
1,3-Dichlorobenzene	ND	ND	ND	0.5
1,4-Dichlorobenzene	ND	ND	ND	0.5
Ethylbenzene	ND	ND	ND	0.5
Toluene	ND	5.7	8.4	1.0
Total Xylenes	ND	ND	4.0	2.0
Detection limit factor:	1.00	1.00	1.00	
Surrogate Recovery %:	71	67	74	
Analysis date:	11/21/86	11/20/86	11/20/86	

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Table 2. Analysis Type: 8020 QA

Sample Type: Sample ID#:	MB1 999998	MB2 999998	MB3 999998	SB1 99998	DET 999999
Compound					
Benzene	ND	ND	ND	ND	0.5
Chlorobenzene	ND	ND	ND	ND	0.5
1,2-Dichlorobenzene	ND	ND	ND	ND	0.5
1,3-Dichlorobenzene	ND	ND	ND	ND	0.5
1,4-Dichlorobenzene	ND	ND	ND	ND	0.5
Ethylbenzene	ND	ND	ND	ND	0.5
Toluene	ND	ND	ND	ND	1.0
Total Xylenes	ND	ND	ND	ND	2.0
Detection limit factor:	1.00	1.00	1.00	1.00	
Surrogate Recovery %:	73	51	62	52	
Analysis date:	11/19/86	11/20/86	11/21/86	11/20/86	

Aerovirontett 9611-044 File 50211349

Table 2. Analysis Type: 8020 GA (continued)

Sample Type: Sample ID#:	LDU 000785	LSF 00078 <b>4</b>	MSL 000784		9 <b>9999</b>
Compound		Concentr	ation ug/L	_	
Benzene Chlorobenzene 1,2-Dichlorobenzene 1,3-Dichlorobenzene 1,4-Dichlorobenzene Ethylbenzene Toluene Total Xylenes	0.7 ND ND ND ND ND 7.4 3.3	98 96 103 92 103 94 97	7. 5 7. 5 7. 5 7. 5 7. 5	5 5 5 5 5 5 5 5	0.5 0.5 0.5 0.5 0.5
Detection limit factor:  Surrogate Recovery %:  Analysis date:	1.00 79 11/20/86	1.00	11/20/86	<b>.</b>	

ND - not detected at detection limit times factor

% - percent recovery from spiked sample

s - amount spiked in sample



520 10 200

## **Energy & Environmental Division**

Aerovironment 825 Myrtle Ave. Monrovia, Ca 91016

December 5, 1986 Acurex ID#: 8611-047 File 6021147A

Attention: Chris Lovdahl

Subject: Analysis of Six Water Samples

for Volatile Aromatic Organics, Received 11/18/86

Six water samples were analyzed for volatile aromatic organics according to EPA Method 8020 (Test Methods for Evaluating Solid Waste - SWB46, 2nd Ed., 1982). Results are presented in Table 1. Quality assurance data is presented in Table 2. The method can be summarized as follows:

> Helium is bubbled through a volume of water contained in a specially designed purging chamber at ambient temperature. The purgeable aromatic compounds are efficiently transferred from the aqueous phase to the vapor phase. The vapor is swept through a sorbent column where the purgeables are trapped. After purging is complete, the sorbent column is heated and back flushed with helium to desorb the purgeables onto a gas chromatographic column. The gas chromatograph is temperature programmed to separate the purgeables which are then detected with a photoionization detector (PID) run in series with a Hall detector. SP-1000 on Carbopak B is used for the primary analysis. Confirmations are run using a PID alone and a column containing SP-1200 on Bentone-34.

If you should have any questions, please do not hesitate to call.

Submitted by: Jack Schoen, Ph.D.

Staff Chemist

Greg Mcoll

Project Chemist

These results were obtained by following standard laboratory procedures: the liability of Acurex Corporation shall not exceed the amount paid for this report. In no event shall Acurex be liable for special or consequential damages.

Aerovironment 8611-047 File 6021147A

Table 1. Analysis Type: 8020 Results

Sample Type: Sample ID#:	LAN 000790	LAN 000791	LAN 000792	LAN 000793	DET 999999	
Compound	Concentration ug/L					
Benzene	ND	ND	ND	ND	0.5	
Chlorobenzene	ND	ND	ND	ND	0.5	
1,2-Dichlorobenzene	ND	ND	ND	ND	0.5	
1,3-Dichlorobenzene	ND	ND	ND	ND	0.5	
1,4-Dichlorobenzene	ND	ND	ND	ND	0.5	
Ethylbenzene	ND	ND	ND	ND	0.5	
Toluene	2.8	2.0	ND	ND	1.0	
Total Xylenes	3.0	ND	ND	ND	2.0	
Detection limit factor:	1.00	1.00	1.00	1.00		
Surrogate Recovery %:	85	77	101	66		
Analysis date:	11/20/86	11/21/86	11/21/86	11/21/86		

Table 1. Analysis Type: 8020 Results (continued)

Sample Type: Sample ID#:	LAN 000794	LAN 000795	DET 999999
Compound	Con	centration	ug/L
Benzene Chlorobenzene 1,2-Dichlorobenzene 1,3-Dichlorobenzene 1,4-Dichlorobenzene Ethylbenzene Toluene Total Xylenes	0.7 m ND ND ND ND ND ND	ND ND ND ND ND ND	0.5 0.5 0.5 0.5 0.5 0.5
Detection limit factor:	1.00	1.00	
Surrogate Recovery %:	110	81	
Analysis date:	11/21/86	11/21/86	

n - not found in confirmation run

Table 2. Analysis Type: 8020 QA

Sample Type: Sample ID#:	MB1 999998	MB2 999998	MB3 999998	LDU 000793	DET 999999	
Compound	Concentration ug/L					
Benzene	ND	ND	ND	ND	0.5	
Chlorobenzene	ND	ND	ND	ND	்.5	
1,2-Dichlorobenzene	ND	ND	ND	ND	0.5	
1,3-Dichlorobenzene	ND	ND	ND	ND	0.5	
1,4-Dichlorobenzene	ND	ND	ND	ND	0.5	
Ethylbenzene	ND	ND	ND	ND	0.5	
Toluene	ND	ND	ND	ND	1.0	
Total Xylenes	ИВ	ND	ND	ND	2.0	
Detection limit factor:	1.00	1.00	1.00	1.00		
Surrogate Recovery %:	51	62	68	107		
Analysis date:	11/20/86	11/21/86	11/24/86	11/24/86		



## **Energy & Environmental Division**

Aerovironment 825 Myrtle Ave. Monrovia, Ca 91016 December 4, 1936 Acurex ID#: 8611-050

File 6021150A

Attention: Chris Lovdahl

Subject: Analysis of Six Water Samples

for Volatile Aromatic Organics, Received 11/19/86

Six water samples were analyzed for volatile aromatic organics according to EPA Method 8020 (Test Methods for Evaluating Solid Waste - SW846. 2nd Ed., 1982). Results are presented in Table 1. Quality assurance data is presented in Table 2. The method can be summarized as follows:

> Helium is bubbled through a volume of water contained in a specially designed purging chamber at ambient temperature. The purgeable aromatic compounds are efficiently transferred from the aqueous phase to the vapor phase. The vapor is swept through a sorbent column where the purgeables are trapped. After purging is complete, the sorbent column is heated and back flushed with helium to desorb the purgeables onto a gas chromatographic column. The gas chromatograph is temperature programmed to separate the purgeables which are then detected with a photoionization detector (PID) run in series with a Hall detector. SP-1000 on Carbopak B is used for the primar analysis. Confirmations are run using a PID alone and a column containing SP-1200 on Bentone-34.

If you should have any questions, please do not hesitate to call.

Submitted by: Sarah Schoen, Ph.D.

Staff Chemist

Project Chemist

These results were obtained by following standard laboratory procedures: the liability of Acurex Corporation shall not exceed the amount paid for this report. In no event shall Acurex be liable for special or consequential damages.

Table 1. Analysis Type: 8020 Results

Sample Type: Sample ID#:	LAN 000796	LAN 000797	LAN 0007 <b>98</b>	LAN 000799	DET 999999
Compound		)/L			
Benzene	ND	ND	ND	ND	0.5
Chlorobenzene	ND	ND	ND	ND	0.5
1,2-Dichlorobenzene	ND	ND	3.3	3.0	0.5
1,3-Dichlarabenzene	ND	ND	ND	ND	଼, 5
1,4-Dichlorobenzene	ND	ND	3.3	3.0	0.5
Ethylbenzene	ND	ND	ND	ND	0.5
Toluene	ND	ND	ND	ND	1.0
Total Xylenes	ND	ND	ND	ND	2.0
Detection limit factor:	1.00	1.00	1.00	1.00	
Surrogate Recovery %:	75	78	110	102	
Analysis date:	11/21/86	11/21/86	11/24/86	11/24/86	

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Table 1. Analysis Type: 8020 Results (continued)

Sample Type:	LAN	LAN	DET
Sample ID#:	000800	000801	999999
Compound	Conc	entration ug	/L
Benzene Chlorobenzene 1,2-Dichlorobenzene	ND	ND	0.5
	ND	ND	0.5
	ND	ND	0.5
1,3-Dichlorobenzene	N D	ND	0.5
1,4-Dichlorobenzene	N D	ND	0.5
Ethylbenzene	N D	ND	0.5
Toluene	N D	ND	1.0
Total Xylenes	N D	ND	
Detection limit factor: Surrogate Recovery %:	1.00	1.90 7 <b>8</b>	
Analysis date:	11/21/86	11/22/86	

Aerovironment 8611-050 File 6021150A

Table 2. Analysis Type: 8020 QA

Sample Type: Sample ID#:	MB1 999 <b>99</b>	MB2 999998	SB1 999998	LDU 000801	DET 999999
Compound		Conc	entration uq	;/L	
Benzene	ND	ND	ND	ND	0,5
Chlorobenzene	ND	ND	ND	ND	0.5
1,2-Dichlorobenzene	ND	ND	ND	ND	0.5
1,3-Dichlorobenzene	ND	ND	ND	ND	ં.5
1,4-Dichlorobenzene	ND	ND	ND	ND	0.5
Ethylbenzene	ND	ND	ND	ND	0.5
Toluene	ND	ND	ND	ND	1.0
Total Xylenes	ND	ND	ND	ND	2.0
Detection limit factor:	1.00	1.00	1.00	1.00	
Surrogate Recovery %:	62	68	87	72	
Analysis date:	11/21/86	11/24/86	11/24/86	11/22/86	

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Table 2. Analysis Type: 8020 QA (continued)

Sample Type: Sample ID#:	LSP 000801		MSL 000 <b>8</b> 01		DET 999999
Compound	Car	ncen	tration	ug.	/ L
Benzene	100.0	7.	5.0	5	0.5
Chlorobenzene	99.0	7.	5.0	5	0.5
1,2-Dichlorobenzene	96.0	7.	5.0	5	0.5
1,3-Dichlorobenzene	97.0	7.	5.0	5	0.5
1,4-Dichlorobenzene	96.0	۲	5.0	5	0.5
Ethylbenzene	89.0	%	5.0	5	0.5
Toluene	100.0	%	5.0	5	1.0
Total Xylenes	100.0	X	15.0	5	2.0
Detection limit factor:	1.00				
Surrogate Recovery %:	136				

Analysis date: 11/24/86 11/24/86

ND - not detected at detection limit times factor

% - percent recovery from spiked sample

s - amount spiked in sample



Environmental Systems Division

Aerovironment 825 Myrtle Ave. Monrovia, Ca 91016 December 18. 1986 Acure:: ID#: 8612-614 File 6021214A

Attention: Chris Lovdahl

Subject: Analysis of Four Water Samples

for Volatile Aromatic Organics, Received 12/9/86

Four Water Samples were analyzed for volatile aromatic organics according to EPA Method 8020 (Test Methods for Evaluating Solid Waste - SW846, 2nd Ed., 1982). Results are presented in Table 1. Quality assurance data is presented in Table 2. The method can be summarized as follows:

Helium is bubbled through a volume of water contained in a specially designed purging chamber at ambient temperature. The purgeable aromatic compounds are efficiently transferred from the aqueous phase to the vapor phase. The vapor is swept through a sorbent column where the purgeables are trapped. After purging is complete, the sorbent column is heated and back flushed with helium to desorb the purgeables onto a gas chromatographic column. The gas chromatograph is temperature programmed to separate the purgeables which are then detected with a photoionization detector (PID) run in series with a Hall detector. SP-1000 on Carbopak B is used for the primary analysis. Confirmations are run using a PID alone and a column containing SP-1200 on Bentone-34.

If you should have any questions, please do not hesitate to call.

Submitted by:

Sarah Schoen, Ph.D.

Staff Chemist

Greg Micoll

Project Chemist

These results were obtained by following standard laboratory procedures; the inability of Acurex Corporation shall not exceed the amount paid for this report. In no event shall Acurex be liable for special or consequential damages.

Aerovironment Bb12-014 File 60212144

Table 1. Analysis Type: 8020 Results

Sample Type: Sample ID#:	LAN 000601	LAN 000602	LAN 000603	LAN 000604	DET 999999
Compound		  /L			
Benzene	ND	0.9	ND	ND	0.5
Chlorobenzene	ND	ND	ND	ND	9.5
1.2-Dichlorobenzene	ND	ND	ND	ND	0.5
1,3-Dichlorobenzene	ND	ND	ND	ND	0.5
1,4-Dichlarobenzene	ND	ND	ND	ND	0.5
Ethylbenzene	ND	ND	ND	ND	j.5
Toluene	ND	ND	ND	ND	1.0
Total Xylenes	ND	ND	ND	ND	2.0
Detection limit factor:	1.00	1.00	1.00	1.00	
Surrogate Recovery %:	105	119	106	103	
Analysis date:	12/11/86	12/11/86	12/11/86	12/11/86	

Table 2. Analysis Type: 8020 QA

Sample Type: Sample ID#:	MB1 999998	581 999998	DET 999999			
Compound		Concentration ug/L				
Benzene	ND	ND	0.5			
Chlorobenzene	ND	ND	0.5			
1,2-Dichlorobenzene	ND	ND	0.5			
1,3-Dichlorobenzene	ND	ND	0.5			
1,4-Dichlorobenzene	ND	ND	0.5			
Ethylbenzene	ND	ND	0.5			
Taluene	ND	ND	1.0			
Total Xylenes	ND	ND	2.0			
Detection limit factor:	1.00	1.00				
Surrogate Recovery %:	100	114				
Analysis date:	12/11/86	12/11/86				



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Environmental Systems Division

Aerovironment 825 Myrtle Ave. Monrovia, Ca 91016 December 22, 1986 Acure: ID#: 8612-015 File 6021215A

Attention: Chris Lovdahl

Subject: Analysis of Ten Water Samples

for Volatile Aromatic Organics, Received 12/10/86

Ten water samples were analyzed for volatile aromatic organics according to EFA Method 8020 (Test Methods for Evaluating Solid Waste - 5W846, 2nd Ed., 1982). Results are presented in Table 1. Quality assurance data is presented in Table 2. The method can be summarized as follows:

Helium is bubbled through a volume of water contained in a specially designed purging chamber at ambient temperature. The purgeable aromatic compounds are efficiently transferred from the aqueous phase to the vapor phase. The vapor is swept through a soment column where the purgeables are trapped. After purging is complete, the soment column is heated and back flushed with helium to desorb the purgeables onto a gas chromatographic column. The gas chromatograph is temperature programmed to separate the purgeables which are then detected with a photoionization detector (PID) run in series with a Hall detector. SP-1000 on Carbopak B is used for the primary analysis. Confirmations are run using a PID alone and a column containing SP-1200 on Bentone-34.

If you should have any questions, please do not hesitate to call.

Submitted by:

Sarah Schoen, Ph.D.

Staff Chemist

Greg Micoll Proyect Chemist

These results were obtained by following standard laboratory procedures: the liability of Acurex Corporation shall not exceed the amount paid for this report. In no event shall Acurex be liable for special or consequential damages.

Herovinonne n Beille is File e lului-

Table 1. Analysis Type: 8020 Results

Sample Type: Sample ID#:	LAN 000605	LAN 000606	LAN 000607	000608	2 <b>5.</b> 200030
Compound		Conce	entration ug	]/L	
Benzene	ND	ND	ND	ND	:,5
Chlorobenzene	ND	ND	ND	ND	, 5
1,2-Dichlorobenzene	ND	ND	ND	ND	1.5
1.3-Dichlorobenzene	ΝĐ	ND	ND	ND	, =
1.4-Dichlorobenzene	ND	ND	ND	ND	: . =
Ethylbenzene	ND	ND	ND	ND	.5
Toluene	ND	ND	ND	ND	
Total Xylenes	ND	ND	ND	ND	Į. ·
Detection limit factor:	1.00	1.00	1.00	1.00	
Surrogate Recovery %:	99	73	138	119	
Analysis date:	12/11/86	12/11/86	12/11/86	12/19/85	

Aers.irontent 8512-015 File 80212184

Table 1. Analysis Type: 8020 Results (continued)

Sample Type: Sample ID#:	LAN 000609	LAN 000610	LAN 000611	LAN 000612	DET 999959
Campound		Conce	entration ug	/L	
Benzene	ND	ND	0.7 n	1.1	).5
Chlorobenzene	ND	ND	ND	ND	0.5
1,2-Dichlorobenzene	ND	ND	ND	ND	9.5
1.3-Dichlorobenzene	ND	ND	ND	ND	0.5
1,4-Dichlorobenzene	ND	ND	ND	ND	3.5
Ethylbenzene	ND	ND	ND	ND	0.5
Toluene	פא	ND	ND	ND	1.0
Total Xylenes	ИΝ	ND	ND	ND	2.0
Detection limit factor:	1.00	1.00	1.00	1.00	
Surrogate Recovery %:	109	127	95	101	
Analysis date:	12/11/86	12/11/86	12/11/86	12/12/86	

ND - not detected at detection limit times factor

n - not found in confirmation run

Table 1. Analysis Type: 8020 Results (continued)

Sample Type: Sample ID#:	LAN 000613	LAN 000614	DET 999999
Compound	Conc	entration	ug/L
Benzene Chlorobenzene 1,2-Dichlorobenzene 1,3-Dichlorobenzene 1,4-Dichlorobenzene Ethylbenzene Toluene Total Xylenes	2.1 m ND ND ND ND ND ND	1 1.5 0.7 ND ND ND ND ND	0.5 0.5 0.5 0.5 0.5 0.5 1.0 2.0
Detection limit factor:	1.00	1.00	
Surrogate Recovery %:	109	124	
Analysis date:	12/12/86	12/12/86	

n - not found in confirmation run

Table 2. Analysis Type: 8020 QA

Sample Type: Sample ID#:	MB1 999998	MB2 999998	MB3 999998	SB1 999998	DET 999999
Compound		]/L			
Benzene	ND	ND	ND	ND	0.5
Chlorobenzene	ND	ND	ND	ND	0.5
1,2-Dichlorobenzene	ND	ND	ND	ND	0.5
1,3-Dichlorobenzene	ND	ND	ND	ND	0.5
1,4-Dichlorobenzene	ND	ND	ND	ND	0.5
Ethylbenzene	ND	ND	ND	ND	9.5
Toluene	ND	ND	ND	ND	1.0
Total Xylenes	ND	ND	מא	ND	2.0
Detection limit factor:	1.00	1.00	1.00	1.00	
Surrogate Recovery %:	100	130	72	112	
Analysis date:	12/11/86	12/12/86	12/19/86	12/12/86	

Table 2. Analysis Type: 8020 QA (continued)

Sample Type: Sample ID#:	LDU 000613	DET 999999
Compound	Concentrati	on ug/L
Benzene Chlorobenzene 1,2-Dichlorobenzene 1,3-Dichlorobenzene 1,4-Dichlorobenzene Ethylbenzene Toluene Total Xylenes	2.0 n ND ND ND ND ND ND	0.5 0.5 0.5 0.5 0.5 0.5 1.0 2.0
Detection limit factor:	1.00	
Surrogate Recovery %:	97	

Analysis date: 12/12/86

ND - not detected at detection limit times factor

n - not confirmed





**Environmental Systems Division** 

Aerovironment 825 Myrtle Ave. Monrovia, Ca 91016 December 19, 1986 Acurex ID#: 8612-019 File 6021219A

Attention: Chris Lovdahl

Subject: Analysis of Fourteen Water Samples

for Volatile Aromatic Organics, Received 12/11/86

Fourteen water samples were analyzed for volatile aromatic organics according to EPA Method 8020 (Test Methods for Evaluating Solid Waste - SW846, 2nd Ed., 1982). Results are presented in Table 1. Quality assurance data is presented in Table 2. The method can be summarized as follows:

> Helium is bubbled through a volume of water contained in a specially designed purging chamber at ambient temperature. The purgeable aromatic compounds are efficiently transferred from the aqueous phase to the vapor phase. The vapor is swept through a sorbent column where the purgeables are trapped. After purging is complete, the sorbent column is heated and back flushed with helium to desorb the purgeables onto a gas chromatographic column. The gas chromatograph is temperature programmed to separate the purgeables which are then detected with a photoionization detector (PID) run in series with a Hall detector. SP-1000 on Carbopak B is used for the primary analysis. Confirmations are run using a PID alone and a column containing SP-1200 on Bentone-34.

If you should have any questions, please do not hesitate to call.

Submitted by: Sarah Schoen, Ph.D.

Frey havel

Project Chemist

These results were obtained by following standard laboratory procedures; the liability of Acurex Corporation shall not exceed the amount paid for this report. In no event shall Acurex be liable for special or consequential damages.

Table 1. Analysis Type: 8020 Pesults

Sample Type: Sample ID#:	LAN 000615	LAN 000616	LAN 000617	LAN 000619	200000 2E+
Compound		Conce	entration up	1/L	
Benzene	ND	ND	ND	ND	
Chlorobenzene	ND	ND	ND	ND	. 5
1,2-Dichlorobenzene	ND	ND	ND	ND	:.5
1.3-Dichlorobenzene	ND	ND	ND	ND	
1,4-Dichlorobenzene	ND	ND	ND	ND	1.5
Ethylbenzene	ND	ND	ND	ND	1.5
Toluene	ND	ND	ND	ND	1.0
Total Xylenes	ND	DM	ND	ND	2.)
Detection limit factor:	1.00	1.00	1.00	1.00	
Surrogate Recovery %:	114	96	93	112	
Analysis date:	12/12/86	12/12/86	12/12/86	12/12/86	

Aerovinontann Baila 19 File allilia

Table 1. Analysis Type: 8020 Results (continued)

Sample Type: Sample ID#:	LAN 000619	LAN 000620	LAN 000621	LAN 000622	DET 999333
Compound	Concentration ug/L				
Benzene	ND	ND	ND	ND	3.5
Chlorobenzere	ND	ND	ND	ND	€.5
1,2-Dichlorobenzene	ND	ND	ND	ND	. 5
1,3-Dichlorobenzene	ND	ND	ND	ND	: . 5
1,4-Dichlorobenzene	ND	ND	ND	ND	:.5
Ethylbenzene	ND	ND	ND	ND	ે.૬
Taluene	ND	ND	ND	ND	1
Total Xylenes	DM	ΝЪ	ND	ND	2.0
Detection limit factor:	1.00	1.00	1.00	1.00	
Surrogate Recovery %:	107	101	130	89	
Analysis date:	12/12/86	12/12/86	12/12/86	12/12/86	

Aerolironnen; Beil2-019 File b0012194

Table 1. Analysis Type: 8020 Results (continued)

Sample Type: Sample ID#:	LAN 000623	LAN 000624	LAN 000625	LAN 000625	600000 DE_
Compound	Concentration ug/L				
Benzene	ND	ND	ND	ND	: . 5
Chlorobenzene	ND	ND	ND	ND	0.5
1,2-Dichlorobenzene	ND	ND	ND	ND	1.5
1,3-Dichlorobenzene	ND	ND	ND	ND	٦, 5
1,4-Dichlorobenzene	ND	ND	ND	ND	1.5
Ethylbenzene	ND	ND	ND	ND	∴. 5
Toluene	N D	ПN	ND	ND	
Total Xylenes	ND	ND	ND	ND	2.9
Detection limit factor:	1.00	1.00	1.00	1.00	
Surrogate Recovery %:	108	83	78	85	
Analysis date:	12/12/86	12/12/86	12/13/86	12/13/86	

Aerolirotten Boll-619 File & 21219B

Table 1. Analysis Type: 8020 Results (continued)

Sample Type: Sample ID#:	LAN 000627	LAN 000628	DET 999999			
Compound		Concentration ug/L				
Benzene	ND	ND	Ů. <b>5</b>			
Chlorobenzene	ND	ND	0.5			
1,2-Dichlorobenzene	ND	ND	0.5			
1,3-Dichlorobenzene	ND	ND	0.5			
1,4-Dichlorobenzene	ND	ND	0.5			
Ethylbenzene	ND	ND	0.5			
Toluene	ND	ND	1.0			
Total Xylenes	ND	ND	2.0			
Detection limit factor:	1.00	1.00				
Surrogate Recovery %:	91	147				
Analysis date:	12/13/86	12/15/86				

Herovirontant Ball-119 File billing

Table 2. Analysis Type: 8020 DA

Sample Type: Sample ID#:	MB1 999998	MB2 999998	MB3 99998	SB1 999998	3E ⁺ 999999		
Compound	Concentration ug/L						
Benzene	ND	ND	ND	ND	0.5		
Chlorobenzene	ND	ND	ND	ND	. • =		
1.2-Dichlorobenzene	ND	ND	ND	ND	9.5		
1,3-Dichlorobenzene	ND	ND	ND	ND	• . 5		
1,4-Dichlorobenzene	ND	ND	ND	ND	્. ૬		
Ethylbenzene	NÐ	ND	ND	ND	5		
Toluene	ND	ND	ND	ND	1.4		
Total Xylenes	ND	ND	ND	ND	2.0		
Detection limit factor:	1.00	1.00	1.00	1.00			
Surrogate Recovery %:	130	130	90	114			
Analysis date:	12/12/86	12/15/86	12/17/86	12/12/86			

Aerovironnenn 3612-119 File bll11133

Table 2. Analysis Type: 8020 QA (continued)

Sample Type: Sample ID#:	LDU 000617	000 <b>6</b> 52 FDU	LSP 000615	MSL 000615		DET 999990
Compound	Concentration ug/L					
Benzene	ND	ND	103	, <u> </u>	- s	3,5
Chlorobenzene	ND	ND	100	% 5	5	1.5
1,2-Dichlorobenzene	ND	ND	89	% 5	s	5
1,3-Dichlorobenzene	ND	ND	98	% 5	s	う. 5
1,4-Dichlorobenzene	ND	ND	98	% 5	s	5
Ethylbenzene	ND	ND	102	% 5	s	3.5
Toluene	ND	ND	100	% 5	5	1.)
Total Xylenes	ND	ND	102	7 15	s	2.0
Detection limit factor:	1.00	1.00	1.00	1.00		
Surrogate Recovery %:	105	85	94	0		
Analysis date:	12/17/86	12/17/86	12/17/86	ERR		



Environmental Systems Division

Aerovinonment 815 Myrtle Ave. Monrovia, Ca 91016 December 23. 1986 Acure: ID#: 8612-020 File 6021220A

Attention: Chris Lovdahl

Euplect: Analysis of Ten Water Samples

for Volatile Aromatic Organics. Received 12/12/86

Ten water samples were analyzed for volatile aromatic organics according to EFA Method 8020 (Test Methods for Evaluating Solid Waste - SW846, 2nd Ed., 1982). Results are presented in Table 1. Quality assurance data is presented in Table 2. The method can be summarized as follows:

> Helium is bubbled through a volume of water contained in a specially designed purging chamber at ambient temperature. The purgeable aromatic compounds are efficiently transferred from the aqueous phase to the vapor phase. The vapor is swept through a sorbent column where the purgeables are trapped. After purging is complete, the sorbent column is heated and back flushed with helium to desorb the purgeables onto a gas chromatographic column. The gas chromatograph is temperature programmed to separate the purgeables which are then detected with a photoionization detector (PID) run in series with a Hail detector. SP-1000 on Carbobak B is used for the primary analysis. Confirmations are run using a PID alone and a column containing 3P-1200 on Bentone-34.

If you should have any questions, please do not hesitate to call.

Submitted by: Sul Schoen, Ph.D.

Sieg Wiedl Project Chemist

These results were obtained by following standard laboratory procedures: the liability of Acurex Corporation shall not exceed the amount paid for this report. in no event shall Acurex be liable for special or consequential damages.

Aeravironment 8612-020 File 60012204

Table 1. Analysis Type: 8020 Results

Sample Type: Sample ID#:	LAN 000629	LAN 000630	LAN 000631	LAN 900632	DE T 999999		
Compound	Concentration ug/L						
Benzene	ND	ND	ND	ND	1.5		
Chlorobenzene	ND	ND	ND	NÐ	7.5		
1,2-Dichlorobenzene	ND	ND	ND	ND	1.5		
1,3-Dichlorobenzene	ND	ND	ND	ND	ə. <del>5</del>		
1,4-Dichlorobenzene	ND	ND	ND	ND	9.5		
Ethylbenzene	ND	ND	ND	ND	). <b>5</b>		
Toluene	1.7	1.6	ND	ND	1.0		
Total Xylenes	ND	ND	ND	מא	2.5		
Detection limit factor:	1.00	1.00	1.00	1.00			
Surrogate Recovery %:	107	82	99	94			
Analysis date:	12/15/86	12/17/86	12/22/86	12/22/86			

Henduuri Yart Balde I File a Cul H

Table 1. Analysis Type: 8020 Results (continued)

Sample T.pe: Sample ID#:	LAN 000633	LAN 000634	LAN 000635	LAN 000616	3E*
Campound		Conce	entration ug		
Benzene	0.8	ND	2.1 n	ND	
Chlorobenzene	ND	ND	ND	NJ 🖰	
1,2-Dichlorobenzene	ND	ND	ND	NO	<del>-</del>
1.3-Dichlorobenzene	ND	ND	ND	ΝĐ	, =
1,4-Dichlorobenzene	ND	ND	ND	ND	
Ethylbenzene	ND	ND	ND	ND	
Toluene	ND	ND	ND	СN	
Total Xylenes	ND	ND	ND	ND	<b>.</b>
Detection limit factor:	1.00	1.00	1.00	1.00	
Surrogate Recovery %:	98	97	101	95	
Analysis date:	12/22/86	12/22/86	12/22/86	12/22/36	

ND - not detected at detection limit times factor

n - not found in confirmation run

Table 1. Analysis Type: 8020 Results (continued)

Sample Type: Sample ID#:	LAN 000637	000628 Lan	DET 999999
Compound		Concer	itration ug/L
Benzene Chlorobenzene 1.2-Dichlorobenzene 1,3-Dichlorobenzene 1.4-Dichlorobenzene Ethylbenzene Toluene Total Kylenes	ND ND ND ND ND ND	0.7 n ND ND ND ND ND ND	0.5 0.5 0.5 0.5 0.5 0.5
Detection limit factor:	1.00	1.00	2.0
Analysis date:	76 12/22/86	95 12/16/86	

n - not found in confirmation run

Table 2. Analysis Type: 8020 QA

Sample Type: Sample ID#:	MB1 999998	MB2 999998	MB3 999998	MB4 999998	DET 99999		
Compound	Concentration ug/L						
Benzene	ND	ND	ND	ND	1.5		
Chloropenzene	NÐ	ND	ND	ND	9.€		
1,2-Dichlorobenzene	ND	ND	ND	ND	0.5		
1.J-Dichlorobenzene	ND	ND	ND	ND	ÿ. Ē		
1.4-Dichlorobenzene	ND	ND	ND	ND	1.5		
Ethylbenzene	ND	ND	ND	ND	0.5		
Toluene	ND	ND	ND	ND	1.0		
Total Xvlenes	ND	ND	ND	ND	2.0		
Detection limit factor:	1.00	1.00	1.00	1.00			
Surrogate Recovery %:	130	100	99	94			
Analysis date:	12/15/86	12/17/86	12/18/86	12/22/86			

Table 2. Analysis Type: 8020 QA (continued)

Sample Type: Sample ID#:	581 9999 <b>98</b>		LSP 000629		MSL 000629		DE - 909009
Compound		Conce	entration o	ıg/L			
Benzene	ND	0.7	110	·	5	5	· . 5
Chlorobenzene	NÐ	ND	98	7.	5	5	₹.5
1,2-Dichlorobenzene	ND	ND	87	%	5	5	7.5
1,3-Dichlorobenzene	ND	ND	94	7.	5	5	0.5
1,4-Dichlorobenzene	ND	ND	88	%	5	5	}.5
Ethylbenzene	ND	ND	99	7.	5	5	∂.5
Toluene	ND	1.3	100	γ,	5	s	1.9
Total Xylenes	ND	ND	100	7.	15	5	2.0
Detection limit factor:	1.00	1.00	1.00		1.00		
Surrogate Recovery %:	90	100	98				
Analysis date:	12/15/86	12/18/86	12/17/86		12/17/86		

% - percent recovery from spiked sample

s - amount spiked in sample





Environmental Systems Division

Aerovironment 825 Myrtle Ave. Monrovia, Ca 91916 December 29, 1986 Acures ID#: 8612-022 File 6021222A

Attention: Chris Lovdahl

Subject: Analysis of Ten Water Samples

for Volatile Aromatic Organics, Received 12/13/86

Ten water samples were analyzed for volatile aromatic organics according to EPA Method 8020 (Test Methods for Evaluating Solid Waste - SW846, 2nd Ed., 1982). Results are presented in Table 1. Quality assurance data is presented in Table 2. The method can be summarized as follows:

> Helium is bubbled through a volume of water contained in a specially designed purging chamber at ambient temperature. The purgeable aromatic compounds are efficiently transferred from the aqueous phase to the vapor phase. The vapor is swept through a sorbent column where the purgeables are trapped. After purging is complete, the sorbent column is heated and back flushed with helium to desorb the purgeables onto a gas chromatographic column. The gas chromatograph is temperature programmed to separate the purgeables which are then detected with a photoionization detector (PID) run in series with a Hall detector. SP-1000 on Carbopak B is used for the primary analysis. Confirmations are run using a PID alone and a column containing SP-1200 on Bentone-34.

If you should have any questions, please do not hesitate to call.

Sarah Schoen, Ph.D.

Project Chemist

These results were obtained by following standard laboratory procedures: the liability of Acurex Corporation shall not exceed the amount paid for this report. In no event shall Acurex be liable for special or consequential damages.

Aero., roomero 8512- 33 File 5/312334

Table 1. Analysis Type: 8020 Results

Sample Type: Sample ID#:	LAN 000639	LAN 000640	LAN 000641	LAN 000642	0E7 9 <b>90</b> 30 <b>9</b>
Compound		Conce	entration up	1/L	******
äenzene	ND	ND	ND	ND	
Chlorobenzene	ND:	ND	ND	ND	
1,2-Dichlorobenzene	ND	ND	ND	ND	. , 5
1,3-Dichlarobenzene	ND	ND	ND	ND	. =
1.4-Dichlorobenzene	ND	ND	ND	ND	₹.5
Ethylbenzene	ND	ND	ND	ND	. 5
Toluene	ND	ND	ND	ND	1.9
Total Xylenes	ND	ND	ND	מא	2.3
Detection limit factor:	1.00	1.00	1.00	1.00	
Surrogate Recovery %:	96	69	70	61	
Analysis date:	12/18/86	12/18/86	12/18/86	12/18/86	

Table 1. Analysis Type: 8020 Results (continued)

Sample Type: Sample ID#:	LAN 000643	LAN 000644	LAN 000645	LAN 000646	630362 DE_		
Compound	Concentration ug/L						
Benzene	22	ND	ND	ND	, :		
Chlorobenzere	ND	ND	ND	NC	1.5		
1,2-Dichlorobenzene	ND	ND	ND	ND	5		
1.3-Dichlorobenzene	ND	ND	ND	ND	· <b>.</b> 5		
1,4-Dichlorobenzene	1.6	ND	ND	N D	. 5		
Ethylbenzene	1.6	ND	ND	1.0	) <b>.</b> 5		
Toluene	6.8	ND	1.3	ND	1.3		
Total Aylenes	8.2	ND	ND	9.0	2.1		
Detection limit factor:	1.00	1.00	1.00	1.00			
Surrogate Recovery %:	53	73	61	106			
Analysis date:	12/18/86	12/22/86	12/22/86	12/19/86			

Table 1. Analysis Type: 8020 Results (continued)

Sample T.pe: Sample ID#:		LAN 000648	DET 999999			
Compound		Concentration ug/L				
Benzene Chlorobenzene 1.2-Dichlorobenzene 1.3-Dichlorobenzene 1.4-Dichlorobenzene Ethylbenzene Toluene Total Xylenes	ND ND ND ND ND ND	N D N D N D N D N D N D N D	0.5 0.5 0.5 0.5 0.5 1.0			
Detection limit factor:	1.00	1.00				
Surrogate Recovery %:	103	102				
Analysis date:	12/19/86	12/23/86				

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Table 2. Analysis Type: 8020 QA

Sample Type: Sample ID#:	MB1 999998	MB2 999998	MB3 99998	MB4 999998	0E T
Compound		Conc	entration us	<b>]</b> /L	
Senzene	ND	ND	ND	ND	. 5
Chlorobenzene	ND	ND	ND	ND	. 5
1,2-Bichlorobenzene	ND	ND	ND	ND	· , =
i.J-Dichloropenzene	ND	ND	ND	ND	5
1.4-Dichlorobenzene	ND	ND	ND	٧D	1, =
Ethvlbenzene	ND	ND	ND	٩p	♦.5
[†] oluen <b>e</b>	ND	ND	ND	ND	• •
Total Xvlenes	ND	ND	ND	ND	2 3
Detection limit factor:	1.00	1.00	1.00	1.00	
Surrogate Recovery %:	99	72	94	83	
Analysis date:	12/18/86	12/19/86	12/22/86	12/23/86	

Aerovinintani Boll- 21 File byli210

Table 2. Analysis Type: 8020 QA (continued)

Sample Type: Sample ID#:	S&1	LDU 000648	LSP 200642	MSL 000642		3E ⁻	
Jampaund	Concentration ug/L						
Benzene	N D	ND	95	Υ 5	5		
Chloroberzene	ND	ND	96	% 5	s	1.5	
1,2-Dichlorobenzene	ND	٧D	100	". 5	5	. ፲	
1.3-Dichlorobenzene	ND	ND	100	% 5	S	`. ₹	
1,4-Dichlorobenzene	ND	ND	9 9	<b>.</b> 5	5	5	
Ethylbenzene	ND	ND	92	7. 5	5	. Ξ	
Toluene	ND	ND	24	". 5	s	:	
Total Xylenes	ND	ND	87	15	s	2. :	
Detection limit factor:	1.00	1.00	1.00	1.00			
Surrogate Recovery %:	90	102	97				
Analysis date:	12/23/86	12/23/86	12/23/86	12/23/86			

ND - not detected at detection limit times factor

s - amount spiked in sample

% - percent recovery from spiked sample



Environmental Systems Division

Aerovironment 925 Myrtle Ave. Monrovia, Ca 91016 December 29, 1986 Acure: 10#: 8612-023 File 6021227A

Attention: Chris Lovdani

Subject: Analysis of Thirteen Water Samples

for Volatile Arcmatic Organics, Received 12/15/86

Thirteen water samples were analyzed for volatile aromatic organics according to EPA Method 8020 (Test Methods for Evaluating Solid Waste - SW846, 2nd Ed., 1932). Results are presented in Table 1. Quality assurance data is presented in Table 2. The method can be summarized as follows:

> Helium is bubbled through a volume of water contained in a specially designed purging champer at ambient temperature. The purgeable aromatic compounds are efficiently transferred from the aqueous phase to the vapor phase. The vapor is swept through a sorbent column where the purgeables are trapped. After purging is complete. the sorbent column is heated and back flushed with helium to desorb the purgeables onto a gas chromatographic column. The gas chromatograph is temperature programmed to separate the purgeables which are then detected with a photoionization detector (PID) run in series with a Hall detector. SP-1000 on Carbopak B is used for the primary analysis. Confirmations are run using a PID alone and a column containing SP-1200 on Bentone-34.

If you should have any questions, please do not hesitate to call.

Submitted by: Sarah Schoen, Ph.D.

Staff Chemist

Project Chemist

These results were obtained by following standard laboratory procedures: the liability of Acurex Corporation shall not exceed the amount paid for this report. In no event shall Acurex be liable for special or consequential damages.

4eroving 1871 3612-137 File 6 20224

Table 1. Analysis Type: 8020 Results

Sample Type: Sample ID#:	LAN 000649	LAN 000650	LAN 000651	14 <b>4</b> 000652	36.2 36.3233
Compound					
Benzene	ND	ND	ND	ND	.5
Chlorobenzene	ND	ND	ND	ND	. 5
1.2-Dichlorobenzene	ND	ND	ND	ND	1.5
1.3-Dichlorobenzene	ND	ND	ND	ND	. 5
1.4-Dichlorobenzene	ND	ND	ND	ND	. 5
Ethylbenzene	ND	ND	ND	ND	€.5
Taluene	ND	ND	ND	ND	1.3
Total Xylenes	ND	ND	ND	۷D	2.
Detection limit factor:	1.00	1.00	1.00	1.00	
Surrogate Recovery %:	104	101	95	85	
Analysis date:	12/19/86	12/19/86	12/19/86	12/19 96	

Aerovinontenn 8612-027 File 5 2:0274

Table 1. Analysis Type: 8020 Results (continued)

Sample Type: Sample ID#:	LAN 000653	LAN 000 <b>654</b>	LAN 000655	LAN 000656	DE -	
Compound	Concentration ug/L					
aer:ene	ND	0.6 n	ND	ND	.5	
Chlorobenzene	ND	ND	ND	ND	4.5	
1.2-Dichlorobenzene	ND	ND	ND	ND	. 5	
1.3-Dichlorobenzene	ND	ND	ND	ND	: , 5	
1,4-Dichlorobenzene	ND	ND	ND	G M	. 5	
Ethyibenzene	ND	ND	ND	ND	:. ₹	
Toluene	ND	ND	7.5	ND	1.1	
Total Kylenes	ND	ND	5.5	ND	2.0	
Detection limit factor:	1.00	1.00	1.00	10.00		
Surrogate Recovery %:	75	63	93	65		
Analysis date:	12/19/86	12/19/86	12/23/86	12/23/86		

ND - not detected at detection limit times factor

n - not found in confirmation run

Aero..ronment 8612-127 File 6:2:222-

Table 1. Analysis Type: 8020 Results (continued)

Sample Type: Sample ID#:	LAN 000657	000658	LAN 000659	_AN 000660	35 <b>0</b> 333
Compound		Sance	entration ug	1/ L	
Benzene	2.6 n	ND	ND	ND	, =
Chlorobenzene	ND	ND	ND	ND	1,5
1,2-Dichlorobenzene	ND	ND	ND	ND	. =
1,J-Dichlorobenzene	ND	ND	ND	ND	5
1.4-Dichlorobenzene	ND	ND	ND	ŊD	:.5
Ethylbenzene	ND	ND	ND	מא	9.5
Toluene	ND	ND	ND	ND	1.0
Total Xylenes	ND	ND	ND	ND	2.0
Detection limit factor:	1.00	2.50	1.00	1.00	
Surrogate Recovery %:	104	97	96	94	
Analysis date:	12/22/86	12/23/86	12/23/86	12/23/86	

ND - not detected at detection limit times factor

n - not found in confirmation run

4era,,nartet: 8e12-023 File 6021223

Table 1. Analysis Type: 8020 Results (continued)

Sample T.be: Sample ID#:	LAN 000661	DET 999999
Compound	Concentrat	ion ug/L
Benzene Chlorobenzene 1,2-Dichlorobenzene 1,3-Dichlorobenzene 1,4-Dichlorobenzene Ethylbenzene Toluene Total Xylenes	ND ND ND ND ND ND ND	0.5 0.5 0.5 0.5 0.5 0.5
Detection limit factor: Surrogate Recovery %:	2.50 98	
Analysis date:	12/23/86	

Aerovininaent 8612-421 File 60212278

Table 2. Analysis Type: 8020 QA

Sample Type: Sample ID#:	MB1 999998	MB2 999998	MB3 999998	LDU 000659	3ET 999999
Compound		Canc	entration u	]/L	
Benzene	ND	ND	ND	ND	1.5
Chlorobenzene	ND	ND	ND	ND	. 5
1.2-Dichlorobenzene	ND	ND	ND	NE	),5
1,3-Dichlorobenzene	ND	ND	ND	ND	0.5
1,4-Dichlorobenzene	ND	ND	ND	ND	9.5
Ethylbenzene	ND	ND	ND	ND	0.5
Toluene	ND	ND	ND	ND	1.0
Total Xylenes	ND	ND	ND	ND	2.0
Detection limit factor:	1.00	1.00	1.00	1.00	
Surrogate Recovery %:	84	94	83	98	
Analysis date:	12/19/86	12/22/86	12/23/86	12/23/86	

Table 2. Analysis Type: 8020 QA (continued)

Sample Type: Sample ID#:	LSP 000649		MSL 000649		DET 99999
Campound	Cor	nc e	ntration	ug	/L
Benzene	96	٦ ۲	5	5	0.5
Chlorobenzene	95	7.	5	5	0.5
1,2-Dichlorobenzene	96	%	5	5	0.5
1,3-Dichlorobenzene	96	7.	5	5	0.5
1,4-Dichlorobenzene	94	%	5	5	0.5
Ethylbenzene	98	7.	5	5	0.5
Toluene	97	%	5	5	1.0
Total Xylenes	91	7.	15	s	2.0
Detection limit factor:	1.00		1.00		
Surrogate Recovery %:	102				

Analysis date: 12/23/86 12/23/86

ND - not detected at detection limit times factor

s - amount spiked in sample

% - percent recovery from spiked sample



Environmental Systems Division

Aerovironment 315 Myrtle Ave. Honrovia, Ca 91015 January 15, 1987 Acurex ID#: Mather AFB File CON602A

Attention: Chris Lovdahl

Subject: Confirmation of Thirty-three Water Samples

for Volatile Aromatic Organics, Received 11/12/86

through 12/15/86

Thirty-three water samples were confirmed for volatile aromatics according to EPA Method 3020 (Test Methods for Evaluating Solid Waste - SW846, 2nd Ed., 1982). Results are presented in Table 1. Quality assurance data is presented in Table 2. The method can be summarized as follows:

Helium is bubbled through a volume of water contained in a specially designed purging chamber at ambient temperature. The purgeable aromatic compounds are efficiently transferred from the aqueous phase to the vapor phase. The vapor is swept through a sorbent column where the purgeables are trapped. After purging is complete, the sorbent column is heated and back flushed with helium to desorb the purgeables onto a gas chromatographic column. The gas chromatograph is temperature programmed to separate the purgeables which are then detected with a photoionization detector (PID) run in series with a Hall detector. SP-1000 on Carbopak B is used for the primary analysis. Confirmations are run using a PID alone and a column containing SP-1200 on Bentone-34.

If you should have any questions, please do not hesitate to call.

Submitted by:

Sarah Schoen, Ph.D.

Staff Chemist

Greg Nacoli

Bearing Chance

Those results were obtained by following standard laboratory procedures; the liability of Acurex Corporation shall not exceed the amount paid for this report. In no event shall Acurex be liable for special or consequential damages.

Table 1. Analysis Type: 8020 Confirmations

Sample Type: Sample ID#:	LAC 0007 <b>54</b>	LAC 0007 <b>55</b>	LAC 000757	LAC 000759	DET 999999	
Compound	Concentration ug/L					
Benzene	ND	ND	ND	ND	0.5	
Chlorobenzene	NC	NC	NC	NC	٦.5	
1.2-Dichlorobenzene	NC	NC	NC	NC	0.5	
1.3-Dichlorobenzene	NC	NC	NC	NC	0.5	
1.4-Dichlorobenzene	NC	NC	NC	NC	0.5	
Ethylbenzene	NC	3.8	NC	NC	0.5	
Taluene	2.6	43	NC	NC	1.0	
Total Xvlenes	NC	23	NC	NC	2.0	
Detection limit factor:	1.00	1.00	1.00	1.00		
Surrogate Recovery %:	93	96	132	79		
Analysis date:	11/18/86	11/18/86	11/18/86	11/18/86		

Table 1. Analysis Type: 8020 Confirmations (continued)

Sample Type: Sample ID#:	LAC 000760	LAC 000774	LAC 0007 <b>85</b>	LAC 000786	DET 99 <b>9</b> 999
Compound		Conce	entration ug	1/L	
Benzene	ND	ND	0.7	NC	3.5
Chlorobenzene	NC	NC	NC	NC	0.5
1,2-Dichlarabenzene	NC	NC	NC	NC	5
1.3-Dichlorobenzene	NC	NC	NC	NC	0.5
1,4-Dichlorobenzene	NC	NC	NC	NC	0.5
Ethylbenzene	NC	NC	NC	NC	ა.5
Toluene	NC	13	12	2.0	1.0
Total Xylenes	24	NC	3.0	NC	2.0
Detection limit factor:	1.00	1.00	1.00	1.00	
Surrogate Recovery %:	79	118	88	78	
Analysis date:	11/18/86	11/21/86	11/21/86	11/21/86	

Table 1. Analysis Type: 8020 Confirmations (continued)

Sample Type: Sample ID#:	LAC 000787	LAC 000788	LAC 000789	LAC 0007 <b>90</b>	DET 999999			
Compound	Concentration ug/L							
Benzene	0.8	NC	ND	NC	0.5			
Chlorobenzene	0.7	NC	NC	NC	0.5			
1.2-Dichlorobenzene	NC	NC	NC	NC	0.5			
1.3-Dichlorobenzene	NC	NC	NC	NC	♦.5			
1.4-Dichlorobenzene	NC	NC	NC	NC	ა.5			
Ethylbenzene	NC	NC	NC	NC	0.5			
Toluene	NC	7.4	9.0	4.0	1.0			
Total Xylenes	NC	NC	3.0	4.0	2.0			
Detection limit factor:	1.00	1.00	1.00	1.00				
Surrogate Recovery %:	78	95	76	7 <b>9</b>				
Analysis date:	11/21/86	11/21/86	11/21/86	11/21/86				

[&]quot;") - not detected at detection limit times factor

NC - not being confirmed

Table 1. Analysis Type: 8020 Confirmations (continued)

Sample Type: Sample ID#:	LAC 000791	LAC 0007 <b>94</b>	LAC 000798	LAC 00 <b>0799</b>	DET 999999
Compound		Conce	entration u	3/L	
Benzene	NC	ND	NC	NC	0.5
Chlorobenzene	NC	NC	NC	NC	0.5
1,2-Dichlorobenzene	NC	NC	1.5	1.7	0.5
1.3-Dichlorobenzene	NC	NC	NC	NC	0.5
1,4-Dichlorobenzene	NC	NC	3.1	1.6	∂.5
Ethylbenzene	NC	NC	NC	NC	0.5
Toluene	3.5	NC	NC	NC	1.0
Total Xylenes	NC	NC	NC	NC	2.0
Detection limit factor:	1.00	1.00	1.00	1.00	
Surrogate Recovery %:	62	50	82	80	
Analysis date:	11/21/86	11/21/86	11/26/86	11/26/86	

Aerovironment Mather AFE File SON6-IS

Table 1. Analysis Type: 8020 Confirmations (continued)

Sample Type: Sample ID#:	LAC 000602	LAC 000611	LAC 000612	LAC 000613	DET
Compound		Cance	entration up	]/L	
Benzene	1.1	ND	1.4	ND NC	). <b>5</b>
Chlorobenzene 1,2-Dichlorobenzene	NC NC	NC NC	NC NC	NC	0.5
1.3-Dichlorobenzene 1.4-Dichlorobenzene	NC NC	NC NC	NC NC	NC NC	0. <b>5</b> 0.5
Ethylbenzen <b>e</b> Toluene	NC NC	NC NC	NC NC	NC NC	9.5 1.9
Total Xylenes	NC	NC	NC	NC	2.0
Detection limit factor:	1.00	1.00	1.00	1.00	
Surrogate Recovery %:	115	95	101	99	
Analysis date:	12/12/86	12/12/86	12/12/86	12/12/86	

ND - not detected at detection limit times factor

Table 1. Analysis Type: 8020 Confirmations (continued)

Sample Type: Sample ID#:	LAC 000614	LAC 000629	000630 LAC	LAC 000631	DET 999999		
Compound	Concentration ug/L						
Benzene	1.0	NC	NC	1.1	Ů.5		
Chlorobenzene	1.9	NC	NC	NC	0.5		
1,2-Dichlorobenzene	NC	NC	NÇ	NC	0.5		
1,3-Dichlorobenzene	NC	NC	NC	NC	0.5		
1,4-Dichlarobenzene	NE	NC	NC	NC	ა.5		
Ethylbenzene	NC	NC	NC	NC	0.5		
Toluene	NC	2.6	1.4	NC	1.0		
Total Xylenes	NE	NC	NC	NC	2.0		
Detection limit factor:	1.00	1.00	1.00	1.00			
Surrogate Recovery %:	91	98	54	98			
Analysis date:	12/12/86	12/17/86	12/17/86	12/17/86			

Table 1. Analysis Type: 8020 Confirmations (continued)

Sample Type: Sample ID#:	LAC 000633	LAC 000635	LAC 00063 <b>8</b>	LAC 000643	DET 9 <b>9</b> 9999
Compound	_	Conci	entration up	ı/L	
Benzene	0.7	ND	ND	15	0.5
Chlorobenzene	NC	NC	NC	NC	0.5
1.2-Dichlorobenzene	NC	NC	NC	NC	ა.5
1,3-Dichlorobenzene	NC	NC	NC	NC	0.5
1.4-Dichlorobenzene	NC	NC	NC	0.9	0.5
Ethylbenzene	NC	NC	NC	2.8	0.5
Toluene	NC	NC	NC	13	1.5
Total Xylenes	NC	NC	NC	10	2.0
Detection limit factor:	1.00	1.00	1.00	1.00	
Surrogate Recovery %:	104	84	94	<b>9</b> 9	
Analysis date:	12/17/86	12/22/86	12/17/86	12/19/86	

Table 1. Analysis Type: 8020 Confirmations (continued)

Sample Type: Sample ID#:	LAC 000 <b>645</b>	LAC 000646	LAC 000654	LAC 00 <b>0</b> 65 <b>5</b>	DET 999999
Compound					
Benzene	NC NC	NC	ND	NC	0.5
Chlorobenzene	NC	NC	NC	NC	ે.5
1,2-Dichlorobenzene	NC	NC	NC	NC	0.5
1,3-Dichlorobenzene	NC	NC	NC	NC	0.5
1,4-Dichlorobenzene	NC	NC	NC	NC	0.5
Ethylbenzene	NC	1.5	NC	NC	0.5
Toluene	1.4	NC	NC	10	1.0
Total Xylenes	NE	10	NC	7.0	2.0
Detection limit factor:	1.00	1.00	1.00	1.00	
Surrogate Recovery %:	87	91	94	97	
Analysis date:	12/23/86	12/19/86	12/22/86	12/23/86	

Table 1. Analysis Type: 8020 Confirmations (continued)

Sample Type: Sample ID#:	LAC 000657	DET 999999	
Compound	Concentrat	ion ug/L	
Benzene	ND	0.5	
Chlorobenzene	NC	0.5	
1,2-Dichlorobenzene	NC	0.5	
1,3-Dichlorobenzene	NC	0.5	
1,4-Dichlorobenzene	NC	0.5	
Ethylbenzene	NC	9.5	
Toluene	NC	1.0	
Total Xylenes	NC	2.0	
Detection limit factor:	1.00		
Surrogate Recovery %:	82		

Analysis date: 12/22/86

ND - not detected at detection limit times factor

Table 2. Analysis Type: 8020 Confirmations QA

Sample Type: Sample ID#:	MB1 999998	MB2 999998	MB3 999998	MB4 999998	DET 999999		
Compound	Concentration ug/L						
Benzene	ND	ND	ND	ND	j.5		
Chlorobenzene	ND	ND	ND	ND	. 5		
1,2-Dichlorobenzene	ND	ND	ND	ND	3.5		
1,3-Dichlorobenzene	ND	ND	ND	ND	9.5		
1,4-Dichlorobenzene	ND	ND	ND	ND	0.5		
Ethylbenzene	1.0	ND	0.8	0.6	0.5		
Toluene	ND	ND	ND	ND	1.)		
Total Xylenes	ND	ND	ND	ND	2.0		
Detection limit factor:	1.00	1.00	1.00	1.00			
Surrogate Recovery %:	123	116	82	92			
Analysis date:	11/18/86	11/21/86	11/26/86	12/12/86			

Aerovironment Mather AFE File CONSCIO

Table 2. Analysis Type: 8020 Confirmations QA (continued)

Sample Type: Sample ID#:	MB5 79999B	MB6 99998	MB7 999998	030300 DE1
Compound		Conce	entration ug/	L
Benzene	N D	ND	ND	0.5
Chlorobenzene	ND	ND	ND	0.5
1,2-Dichlorobeniene	ND	ND	ND	0.5
1.3-Dichlorobenzene	ND	ND	ПN	0.5
1.4-Dichlorobenzene	ND	ND	ND	0.5
Ethylbenzene	1.2	2.0	ND	0.5
Toluene	ND	ND	מא	0.1
Total Xylenes	ND	ND	ND	2.0
Detection limit factor:	1.00	1.00	1.00	
Surrogate Recovery %:	94	85	85	
Analysis date:	12/17/86	12/22/86	12/23/86	

ND - not detected at detection limit times factor



Energy & Environmental Division

AeroVironment 315 Myrtle Avenue Monrovia, Da 91016 November 24, 1986 Acurex ID#: 8611-030 File 6011132A

Attention: Chris Lovdahl

Subject: Analysis of Eight Water Samples

for Volatile Halogenated Organics, Received 11/12/86

Eight water samples were analyzed for volatile halogenated organics according to EPA Method 601 (Federal Register, Volume 49 #209, October 26, 1984; page 29). Results are presented in Table 1. Quality assurance data is presented in Table 2. The method can be summarized as follows:

Helium is bubbled through a volume of water contained in a specially designed purging chamber at ambient temperature. The purgable halogenated organic compounds are efficiently transferred from the aqueous phase to the vapor phase. The vapor is swept through a sorbent column where the purgeables are trapped. After purging is completed, the sorbent column heated and back flushed with helium to desorb the purgeables onto a gas chromatographic column. The gas chromatograph is temperature programmed to separate the purgeable which are then detected with a Hall detector run in series with a photoionization detector. SP-1000 on Carbopak B is used for the primary analysis. Confirmations are run using a Hall detector alone and a column containing n-octane on Porasil C.

If you should have any questions, please do not hesitate to call.

Submitted by: Sarah Schoen, Ph.D.

Staff Chemist

Greg Nytoll Project Chemist

These results were obtained by following standard laboratory procedures: the liability of Acurex Corporation shall not exceed the amount paid for this report. In no event shall Acurex be liable for special or consequential damages.

Table 1. Analysis Type: 601 Results

	Sample Type:	LAN		LAN	LAN	LAN	DET
	Sample ID#:	000751		000752	000753	000754	999999
	Compound		•	Concen	tration ug/	L	
	Chloromethane	ND	•	ND	ND	ND	0.5
	Bromomethane	ND		ND	ND	ND	0.5
4	Dichlorodifluoromethane	ND		ND	ND	ND	0.5
4	Vinyl Chloride	ND		ND	ND	ND	0.5
	Chloroethane	ND		ND	ND	ND	0.5
	Methylene Chloride	1.1	a	1.0 a	1.1 a	1.6 a	0.5
	Trichlorofluoromethane	ND		ND	ND	ND	0.5
	1,1-Dichloroethene	ND		ND	ND	ND	0.5
	1,1-Dichloroethane	ND		ND	ND	ND	0.5
	trans-1,2-Dichloroethene	ND		ND	ND	ND	0.5
	Chloroform	ND		ND	ND	ИD	0.5
	1,2-Dichloroethane	ND		ND	ND	ND	0.5
	1,1,1-Trichloroethane	ND		ND	ND	ND	0.5
	Carbon Tetrachloride	ND		ND	ND	ND	0.5
	Bromodichloromethane	ND		ND	ND	ND	0.5
	1.2-Dichloropropane	ND		ND	ND	ND	0.5
	trans-1,3-Dichloropropene	ND		ND	ND	ND	0.5
	Trichloroethene	0.6	n	4.1	ND	ND	0.5
1	Dibromochloromethane	ND		ND	ND	DM	0.5
1	1,1,2-Trichloroethane	ND		ND	ND	ND	0.5
	cis-1,3-Dichloropropene	ND		ND	ND	ND	0.5
	2-Chloroethylvinylether	ND		ND	ND	ND	0.5
	Bromofore	ND		ND	ND	ND	0.5
2	1,1,2,2-Tetrachloroethane	ND		ND	ND	ND	0.5
	Tetrachloroethene	ND		ND	ND	ND	0.5
-	Chlorobenzene	ND		ND	ND	ND	0.5
3	Dichlorobenzenes	ND		ND	ND	ND	0.5

Detection limit factor:	1	1	1	1
Surrogate Recovery %:	82	103	62	81
Analysis date:	11/14/86	11/17/86	11/14/86	11/14/86

^{1 -} these compounds coelute ND - not detected at detection limit times factor 2 - these compounds coelute a - below normal laboratory background levels

^{3 -} mixture of isomers and coassi e

^{4 -} these compounds complute

Table 1. Analysis Type: 601 Results (continued)

	Sample Type: Sample ID#:	LAN 000755	LAN 0007 <b>5</b> 6	LAN 000757	LAN 000758	DET 999999
	Compound	Conce	ntration ug/			
	Chloromethane	ND	ND	ND	ND	).5
	Bromomethane	ND	ND	ND	ND	չ.5
4	Dichlorodifluoromethane	ND	ND	ND	ND	).5
4	Vinyl Chloride	ND	ND	ND	ND	9.5
	Chloroethane	ND	ND	ND	ND	ა.5
	Methylene Chloride	ND	ND	1.6 a	110 a	0.5
	Trichlorofluoromethane	ND	ND	ND	ND	0.5
	1,1-Dichloroethene	ND	ND	ND	ND	0.5
	1,1-Dichloroethane	ND	ND	ND	ND	0.5
	trans-1,2-Dichloroethene	ND	ND	ND	ND	0.5
	Chloroform	ND	ND	ND	ND	0.5
	1,2-Dichloroethane	ND	ND	ND	ND	0.5
	1,1,1-Trichloroethane	ND	ND	ND	ND	ე.5
	Carbon Tetrachloride	ND	ND	ND	ND	0.5
	Bromodichloromethane	ND	ND	ND	ND	0.5
	1,2-Dichloropropane	ND	ND	ND	ND	0.5
	trans-1,3-Dichloropropene	ND	ND	ND	ND	0.5
	Trichloroethene	ND	ND	ND	90	0.5
1	Dibromochloromethane	ND	ND	ND	ND	0.5
1	1.1.2-Trichloroethane	ND	ND	ND	ND	0.5
	cis-1,3-Dichloropropene	ND	ND	ND	DM	0.5
	2-Chloroethylvinylether	ND	ND	ND	ND	0.5
	Bromoform	ND	ND	ND	ND	<b>ن.5</b>
2	1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	0.5
	Tetrachloroethene	ND	ND	ND	ND	0.5
_	Chlorobenzene	ND	ND	ND	ND	).5
3	Dichlorobenzenes	ND	ND	ND	ND	0.5
•			<del>-</del>			

Detection limit factor:	1	1	1	50
Surrogate Recovery %:	96	86	76	123
Analysis date:	11/17/86	11/24/86	11/14/86	11/17/86

^{1 -} these compounds coelute ND - not detected at detection limit times factor 2 - these compounds coelute a - below normal laboratory background levels

^{3 -} mixture of isomers and coelute

^{4 -} these compounds coelute

Table 2. Analysis Type: 601 QA

	Sample Type: Sample ID#:	MB1 999998	MB2 999998	MB3 999998	SB1 999998	DET 9 <b>99</b> 99
	Compound		Concer	stration ug/	L	
	Chloromethane	ND	ND	ND	ND	€.5
	Bromomethane	ND	ND	ND	ND	:· <b>5</b>
4	Dichlorodifluoromethane	ND	ND	ND	ND	0.5
4	Vinyl Chloride	ND	ND	ND	ND	).5
	Chloroethane	ND	ND	ND	ND	0.5
	Methylene Chloride	1.5 a	1.5 a	0.9 a	1.4 a	).5
	Trichlorofluoromethane	ND	ND	ND	ND	0.5
	1,1-Dichloroethene	ND	ND	ND	ND	0.5
	1.1-Dichloroethane	ND	ND	ND	ND	0.5
	trans-1.2-Dichloroethene	ND	ND	ND	ND	0.5
	Chloroform	ND	ND	ND	ND	0.5
	1,2-Dichloroethane	ND	ND	ND	ND	0.5
	1,1,1-Trichloroethane	ND	ND	ND	ND	0.5
	Carbon Tetrachloride	ND	ND	ND	ND	0.5
	Bromodichloromethane	ND	ND	ND	ND	0.5
	1,2-Dichloropropane	ND	ND	ND	ND	3, €
	trans-1,3-Dichloropropene	ND	ND	ND	ND	0.5
	Trichlorgethene	ND	ND	ND	ND	0.5
1	Dibromochloromethane	ND	ND	ND	ND	0.5
-	1,1,2-Trichloroethane	ND	ND	ND	ND	∋.5
	cis-1,3-Dichloropropene	ND	ND	ND	ND	0.5
٠	2-Chloroethylvinylether	ND	ND	ND	ND	٥.5
	Bromoform	ND	ND	ND	ND	0.5
2	1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	0.5
	Tetrachloroethene	ND	ND	ND	ND	0.5
	Chlorobenzene	ND	ND	ND	ND	0.5
-	Dichlorobenzenes	ND	ND	ND	ND	0.5
ر	OTCHIOLODEHY EUGS	110	140	14.0		

Detection limit factor:	1	1	1	1
Surrogate Recovery %:	NS	63	68	104

Analysis date: 11/14/86 11/17/86 11/24/86 11/14/86

^{1 -} these compounds coelute ND - not detected at detection limit times factor 2 - these compounds coelute a - below normal laboratory background levels

^{3 -} mixture of isomers and coelute

^{4 -} these compounds coelute NS - not spiked



Energy & Environmental Division

AeroVironment 825 Myrtis Avenue Monrovia, Ca 9:0:6 November 24, 1986 Acurex ID#: 8611-037 File 6011137A

Attention: Chris Lovdahl

Subject: Analysis of Six Water Samples

for Volatile Halogenated Organics, Received 11/13/86

Six water samples were analyzed for volatile halogenated organics according to EPA Method 601 (Federal Register, Volume 49 #209, October 26, 1984; page 29). Results are presented in Table 1. Quality assurance data is presented in Table 2. The method can be summarized as follows:

Helium is bubbled through a volume of water contained in a specially designed purging chamber at ambient temperature. The purgable halogenated organic compounds are efficiently transferred from the aqueous phase to the vapor phase. The vapor is swept through a sorbent column where the purgeables are trapped. After purging is completed, the sorbent column heated and back flushed with helium to desorb the purgeables onto a gas chromatographic column. The gas chromatograph is temperature programmed to separate the purgeable which are then detected with a Hall detector run in series with a photoionization detector. SP-1000 on Carbopak B is used for the primary analysis. Confirmations are run using a Hall detector alone and a column containing n-octane on Porasil C.

If you should have any questions, please do not hesitate to call.

Submitted by: Junah

Sarah Schoen, Ph.D.

Staff Chemist

Greg Nicoll Project Chemist

These results were obtained by following standard laboratory procedures; the liability of Acurex Corporation shall not exceed the amount paid for this report. In no event shall Acurex be liable for special or consequential damages.

Table 1. Analysis Type: 601 Results

	Sample Type: Sample ID#:	LAN 000759	LAN 000760	LAN 000761	LAN 000762	DET 99999
	Compound		Concen	tration ug/	-	
	Chloromethane	ND	ND	ND	ND	ψ <b>.</b> 5
	Bromomethane	ND	ND	ND	ND	0.5
4	Dichlorodifluoromethane	ND	ND	ND	ND	0.5
4	Vinyl Chloride	ND	ND	ND	ND	0.5
	Chloroethane	ND	ND	ND	ND	ુ.5
	Methylene Chloride	1.4 a	1.4 a	20 a	17 a	0.5
	Trichlorofluoromethane	ND	ND	ND	ND	9.5
	1,1-Dichloroethene	ND	ND	ND	ND	0.5
	1,1-Dichloroethane	ND	מא	ND	ND	0.5
	trans-1,2-Dichloroethene	ND	ND	ND	ND	0.5
	Chloroform	ND	ND	ND	ND	0.5
	1,2-Dichloroethane	ND	ND	ND	ND	0.5
	1,1,1-Trichloroethane	ND	ND	ND	ND	0.5
	Carbon Tetrachloride	ND	ND	ND	ND	0.5
	Bromodichloromethane	ND	ND	ND	ND	1.5
	1,2-Dichloropropane	ND	ND	ND	ND	7.5
	trans-1,3-Dichloropropene	ND	ND	ND	ND	⇒.5
	Trichloroethene	ND	ND	770	700	0.5
1	Dibromochloromethane	ND	ND	ND	ND	0.5
1	1,1,2-Trichloroethane	ND	ND	ND	ND	) <b>.</b> 5
	cis-1,3-Dichloropropene	ND	ND	ND	ND	0.5
	2-Chloroethylvinylether	ND	ND	ND	ND	0.5
	Bromoform	ND	ND	ND	ND	0.5
2	1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	0.5
	Tetrachloroethene	ND	ND	ND	ND	0.5
_	Chlorobenzene	ND	ND	ND	ND	0.5
3	Dichlorobenzenes	ND	ND	ND	ND	0.5

Analysis date:	11/14/86	11/14/86	11/17/86	11/17/86
Surrogate Recovery %:	80	74	99	103
Detection limit factor:	1	1	10	10

^{1 -} these compounds coelute ND - not detected at detection limit times factor 2 - these compounds coelute a - below normal laboratory background levels

^{3 -} mixture of isomers and coelute

^{4 -} these compounds comlute

Table 1. Analysis Type: 601 Results (continued)

	Sample Type: Sample ID#:	LAN 000763	LAN 000764	DET 999999
	Compound	Conce	ntration	ug/L
	Chloromethane	ND	ND.	0.5
	Bromomethane	ND	ND	0.5
4	Dichlorodifluoromethane	ND	ND	0.5
	Vinyl Chloride	ND	ND	0.5
	Chloroethane	ND	ND	0.5
	Methylene Chloride	0.7 a	10	_
	Trichlorofluoromethane	ND	ND	0.5
	1,1-Dichloroethene	ND	ND	0.5
	1,1-Dichloroethane	ND	N D	0.5
	trans-1,2-Dichloroethene	ND	ND	0.5
	Chloroform	ND	ND	0.5
	1.2-Dichloroethane	ND	ND	0.5
	1,1,1-Trichloroethane	ND	ND	0.5
	Carbon Tetrachloride	ND	ND	0.5
	Bromodichloromethane	ND	ND	0.5
	1.2-Dichloropropane	ND	ND	0.5
	trans-1,3-Dichloropropene	ND	ND	0.5
	Trichloroethene	ND	23	0.5
1	Dibromochloromethane	ND	ND	0.5
	1,1,2-Trichloroethane	ND	ND	0.5
1	cis-1,3-Dichloropropene	ND	ND	0.5
	2-Chloroethylvinylether	ND	ND	0.5
	Bromoform	ND	ND	0.5
	1,1,2,2-Tetrachloroethane	ND	ND	0.5
2	Tetrachloroethene	ND	ND	0.5
	Chlorobenzene	ND	ND	0.5
3	Dichlorobenzenes	ND	ND	0.5

Analysis date:	11/17/86	11/17/86
Surrogate Recovery %:	90	107
Detection limit factor:	1	5

^{1 -} these compounds coelute ND - not detected at detection limit times factor a - below normal laboratory background levels

^{3 -} mixture of isomers and coelute

^{4 -} these compounds coelute

Table 2. Analysis Type: 601 QA

	Sample Type: Sample ID#:	MB1 999998	MB2 999998	SB1 999998	LDU 00076 <b>4</b>	DET 999999
	Compound		Concen	tration ug/	-	
	Chloromethane	ND	ND	ND	ND	0.5
	Bromomethane	ND	ND	ND	ND	0.5
	Dichlorodifluoromethane	ND	ND	ND	ND	0.5
4	Vinyl Chloride	ND	ND	ND	ND	0.5
	Chloroethane	ND	ND	ND	ND	0.5
	Methylene Chloride	1.5 a	1.5 a	1.2 a	1.2 a	0.5
	Trichlorofluoromethane	ND	ND	ND	ND	0.5
	1,1-Dichloroethene	ND	ND	ND	ND	0.5
	1,1-Dichloroethane	ND	ND	ND	ND	0.5
	trans-1,2-Dichloroethene	ND	ND	ND	ND	0.5
	Chloroform	ND	ND	ND	NÐ	0.5
	1,2-Dichloroethane	ND	מא	ПD	ND	0.5
	1,1,1-Trichloroethane	ND	ND	ND	ND	0.5
	Carbon Tetrachloride	ND	ND	ND	ND	0.5
	Bromodichloromethane	ND	ND	ND	ND	0.5
	1,2-Dichloropropane	ND	ND	ND	ND	0.5
	trans-1,3-Dichloropropene	ND	ND	ND	ND	0.5
	Trichloraethene	ND	ND	ND	18	0.5
1	Dibromochloromethane	ND	ND	ND	ND	0.5
	1,1,2-Trichloroethane	ND	ND	ND	ND	0.5
	· ·	ND	ND	_	ND	
ı	cis-1,3-Dichloropropene	- · <del>-</del>	· · · ·	ND	· <del>-</del>	0.5
	2-Chloroethylvinylether	ND	ND	D	ND	0.5
_	Bronoform	ND	ND	ND	ND	0.5
	1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	0.5
2	Tetrachloroethene	ND	ND	ND	ND	0.5
	Chlorobenzene	ND	ND	ND	ND	0.5
3	Dichlorobenzenes	ND	ND	ND	ND	0.5

Detection limit factor:	1	1	1	1
Surrogate Recovery %:	NS	63	99	74
Analysis date:	11/14/86	11/17/86	11/17/86	11/18/86

^{1 -} these compounds coelute ND - not detected at detection limit times factor

^{2 -} these compounds coelute — a - below normal laboratory background levels

^{3 -} mixture of isomers and coelute

^{4 -} these compounds coelute NS - not spiked



DE? 1 - ...

**Energy & Environmental Division** 

AeroVironment 325 Myrtle Avenue Monrovia, Ca 91016 December 3, 1986 Acurex ID#: 8611-640 File 6011140A

. Attention: Chr.s Lovdahl

Subject: Fhalysis of Six Water Samples for Volatile Halogenated Organics, Received 11/14/86

i. water samples were analyzed for volatile halogenated organics according to EFA Method 601 (Federal Register, Volume 49 #209, October 26, 1984; page 29:. Results are presented in Table 1. Quality assurance data is prosented in Table 2. The method can be summarized as follows:

> Helium is bubbled through a volume of water contained in a specially designed purging chamber at ambient temperature. The purgable halogenated organic compounds are efficiently transferred from the aqueous phase to the vapor phase. The vapor is swept through a sorbent column where the purgeables are trapped. After purging is completed, the sorbent column heated and back flushed with helium to desorb the purgeables onto a gas chromatographic column. The gas chromatograph is temperature programmed to separate the purgeable which are then detected with a Hall detector run in series with a photoconization detector. SP-1000 on Carbopak B is used for the primary analysis. Confirmations are run using a Hall detector alone and a column containing n-octane on Porasil C.

It you should have any questions, please do not hesitate to call.

Submitted by: Sand Schon

Sarah Schoen, Ph.D.

Staff Chemist

Table 1. Analysis Type: 601 Results

Sample Type: Sample ID#:	LAN 000765	LAN 000766	LAN 000767	LAN 000768	DET 9 <b>9</b> 999 <b>9</b>
Compound		Cond	entration ug	/L	
Chloromethane	ND	ND	ND	ND	0.5
Bromomethane	ND	NÐ	ND	ND	4.5
Dichlorodifluoromethane	ND	ND	ND	ND	0.5
Vinyl Chloride	ND	ND	ND	ND	0.5
Chloroethane	ND	ND	ND	ND	0.5
Methylene Chloride	1.1	a 1.1	a 0.8 a	1.3 a	0.5
Trichlorofluoromethane	ND	ND	ND	ND	0.5
1,1-Dichloroethene	ND	ND	ND	ND	0.5
1,1-Dichloroethane	ND	ND	ND	ND	0.5
trans-1,2-Dichloroethene	ND	ND	ND	GM	0.5
Chloroform	ND	ND	ND	ND	0.5
1,2-Dichloroethane	ND	ND	ND	ND	0.5
1,1,1-Trichloroethane	ND	ND	ND	ND	0.5
Carbon Tetrachloride	ND	1.6	ND	ND	۶.5
Bromodichloromethane	ND	ND	ND	ND	3.5
1,2-Dichloropropane	ND	ND	ND	ND	. 5
trans-1,3-Dichloropropene	ND	ND	ND	ND	0.5
Trichloroethene	2.3		ND	N D	1.5
Dibromochloromethane	ND	D	ND	ND	0.5
1,1,2-Trichloroethane	ND	ND	ND	ND	0.5
cis-1,3-Dichloropropene	ND	ND	ND	ND	0.5
2-Chloroethylvinylether	ND	ND	ND	ND	).5
Bromoform	ND	ND	ND	ND	0.5
1,1,2,2-Tetrachloroethane	ND	12	· · · <del>-</del>	ND	0.5
! Tetrachloroethene	ND	12	ND	ND	0.5
Chlorobenzene	ND	ND	ND	ND	0.5
Dichlorobenzenes	מא	ND	ND	ND	0.5

Detection limit factor:	1.00	1.00	1.00	1.00
Surrogate Recovery %:	106	87	74	112
Analysis date:	11/17/86	11/17/86	11/18/86	11/18/86

^{1 -} these compounds coelute ND - not detected at detection limit times factor 2 - these compounds coelute a - below normal laboratory background levels

^{3 -} mixture of isomers and coelute

^{4 -} these compounds coelute n - not found in confirmation run

Table 1. Analysis Type: 601 Results (continued)

	Sample Type: Sample ID#:	LAN 000769	LAN 000770	DET 999999
	Jambie inw.			
	Compound	Co	ncentration	ug/L
	Chloromethane	ND	ND	0.5
	Bromomethane	ND	ND	0.5
4	Dichlorodifluoromethane	ND	ND	0.5
4	Vinyl Chloride	ND	ND	0.5
	Chloroethane	ND	ПD	0.5
	Methylene Chloride	1.5	a 1.3	a 0.5
	Trichlorofluoromethane	ND	ND	0.5
	1,1-Dichloroethene	ND	ND	0.5
	1,1-Dichloroethane	ND	ND	0.5
	trans-1,2-Dichloroethene	ND	ND	0.5
	Chloroform	ND	ND	0.5
	1,2-Dichloroethane	ND	ND	0.5
	1,1,1-Trichloroethane	ND	0.6	n 0.5
	Carbon Tetrachloride	ND	ND	0.5
	Bromodichloromethane	ND	ND	0.5
	1,2-Dichloropropane	ND	ND	0.5
	trans-1,3-Dichloropropene	ND	ND	0.5
	Trichloroethene	ND	ND	0.5
1	Dibromochloromethane	ND	ND	0.5
1	1,1,2-Trichloroethane	ND	ND	0.5
	cis-1,3-Dichloropropene	ND	ND	0.5
	2-Chloroethylvinylether	ND	ND	0.5
	Bromoform	ND	ND	0.5
2	1,1,2,2-Tetrachloroethane	ND	ND	0.5
	Tetrachloroethene	ND	ND	0.5
	Chlorobenzene	ND	ND	0.5
3	Dichlorobenzenes	ND	ND	0.5

Detection limit factor: 1.00 1.00
Surrogate Recovery %: 103 89

Analysis date: 11/18/86 11/18/86

^{1 -} these compounds compute ND - not detected at detection limit times factor 2 - these compounds compute a - below normal laboratory background levels

^{3 -} mixture of isomers and complute

^{4 -} these compounds coelute n - not found in confirmation run

Table 2. Analysis Type: 601 QA

	Sample Type: Sample ID#:	MB1 99999B	M82 999998	5B1 999998	LDU 000766	DET 9 <b>999</b> 9
	Compound		Concer	itration ug/	/L	
	Chloromethane	ND	ND	ND	ND	0.5
	Bromomethane	ND	ND	ND	ND	0.5
4	Dichlorodifluoromethane	ND	ND	ND	ND	0.5
	Vinyl Chloride	ND	ND	ND	ND	0.5
	Chloroethane	ND	ND	ND	ND	0.5
	Methylene Chloride	1.5 a	ND	ND	0.6 a	0.5
	Trichlorofluoromethane	ND	ND	ND	ND	0.5
	1,1-Dichloroethene	ND	ND	ND	ND	0.5
	1.1-Dichloroethane	ND	ND	ND	ND	0.5
	trans-1,2-Dichloroethene	ND	ND	ND	ND	0.5
	Chloroform	ND	ND	ND	ND	0.5
	1,2-Dichloroethane	ND	ND	ND	ND	0.5
	1,1,1-Trichloroethane	ND	ND	ND	ND	0.5
	Carbon Tetrachloride	ND	ND	ND	1.1	).5
	Bromodichloromethane	ND	ND	ND	ND	0.5
	1,2-Dichloropropane	ND	ND	ND	ND	0.5
	trans-1,3-Dichloropropene	ND	ND	ND	ND	0.5
	Trichloroethene	ND	ND	ND	2.7	0.5
1	Dibromochloromethane	ND	ND	ND	ND	0.5
1	1,1,2-Trichloroethane	ND	ND	ND	ND	0.5
	cis-1,3-Dichloropropene	ND	ND	ND	ND	0.5
	2-Chloroethylvinylether	ND	ND	ND	ND	0.5
	Bromoform	ND	ND	ND	ND	0.5
2	1,1,2,2-Tetrachloroethane	ND	ND	ND	13	0.5
2	Tetrachloroethene	ND	ND	ND	13	0.5
	Chlorobenzene	ND	ND	ND	ND	0.5
3	Dichlorobenzenes	ND	ND	ND	ND	0.5

Detection limit factor:	1.00	1.00	1.00	1.00
Surrogate Recovery %:	63	88	98	91
Anglueie dates	11/17/04	11/19/94	11/19/94	11/19/94

¹ - these compounds coelute ND - not detected at detection limit times factor 2 - these compounds coelute a - below normal laboratory background levels

^{3 -} mixture of isomers and coelute

^{4 -} these compounds coelute

Table 2. Analysis Type: 601 QA (continued)

Sample Type: Sample ID#:	LSP 000767		MSL 000767	<b>.</b> .	DET 999999
Campaund	Car	rc <b>e</b> r	ntration	ug/	/L
Chloromethane	99	7,	10	5	0.5
Bromomethane	98	7.	10	5	0.5
1 Dichlorodifluoromethane	100	%	10	5	0.5
4 Vinyl Chloride	100	%	10	5	0.5
Chloroethane	93	7,	10	5	0.5
Methylene Chloride	70	X	5	5	0.5
Trichlorofluoromethane	100	%	10	5	0.5
1,1-Dichloroethene	110	7.	5	s	0.5
1,1-Dichloroethane	10 <b>0</b>	Z	5	5	0.5
trans-1,2-Dichloroethene	96	Z	5	5	0.5
Chlorofora	110	X	5	5	0.5
1,2-Dichloroethane	57	z	5	5	0.5
1,1,1-Trichloroethane	100	z	5	5	0.5
Carbon Tetrachloride	110	X.	5	5	0.5
Bromodichloromethane	99	χ	5	5	0.5
1,2-Dichloropropane	100	7	5	5	0.5
trans-1,3-Dichloropropene	100	z	5	5	0.5
Trichloraethene	100	7.	5	5	0.5
1 Dibromochloromethane	96	ኧ	5	5	0.5
1 1,1,2-Trichloroethane	96	7.	5	5	0.5
1 cis-1,3-Dichloropropene	96	Z	5	\$	0.5
2-Chloroethylvinylether	130	%	5	5	0.5
Bromoform	92	X.	5	5	0.5
2 1,1,2,2-Tetrachloroethane	120	X.	5	5	0.5
2 Tetrachloroethene	120	z	5	5	0.5
Chlorobenzene	110	7.	5	s	0.5
3 Dichlorobenzenes	110	۲	15	5	0.5

Detection limit factor: 1.00

Surrogate Recovery %: 103

Analysis date: 11/18/86 11/18/86

^{1 -} these compounds coelute ND - not detected at detection limit times factor 2 - these compounds coelute a - below normal laboratory background levels

^{3 -} mixture of isomers and coelute

^{4 -} these compounds comlute shample

^{% -} percent recovery from spiked sample



Energy & Environmental Division

AeroVironment 825 Myrtle Avenue Monrovia, Ca 91016 December 4, 1986 Acurex ID#: 8611-047 File 6011143A

Attention: Chris Lovdahl

Subject: Analysis of Seven Water Samples

for Volatile Halogenated Organics, Received 11/15/86

Seven water samples were analyzed for volatile halogenated organics according to EPA Method 601 (Federal Register, Volume 49 #209, October 26, 1984; page 29). Results are presented in Table 1. Quality assurance data is presented in Table 2. The method can be summarized as follows:

Helium is bubbled through a volume of water contained in a specially designed purging chamber at ambient temperature. The purgable halogenated organic compounds are efficiently transferred from the aqueous phase to the vapor phase. The vapor is swept through a sorbent column where the purgeables are trapped. After purging is completed, the sorbent column heated and back flushed with helium to desorb the purgeables onto a gas chromatographic column. The gas chromatograph is temperature programmed to separate the purgeable which are then detected with a Hall detector run in series with a photoionization detector. SP-1000 on Carbopak B is used for the primary analysis. Confirmations are run using a Hall detector alone and a column containing n-octane on Porasil C.

If you should have any questions, please do not hesitate to call.

Submitted by:

Sarah Schoen, Ph.D.

Staff Chemist

Greg Nicoll

Project Chemist

Table 1. Analysis Type: 601 Results

	Sample Type: Sample ID#:	LAN 000771	LAN 000772	LAN 000773	LAN 000774	DET 999999
	Compound		Conc	entration ug/	L	
	Chloromethane	ND	ND	ND	ND	0.5
	Bromomethane	ND	ND	ND	ND	0.5
4	Dichlorodifluoromethane	ND	ND	ND	ND	0.5
4	Vinyl Chloride	ND	ND	ND	ND	0.5
	Chloroethane	ND	ND	ND	ND	0.5
	Methylene Chloride	8.8	9.9	a 0.7 a	8.0 a	0.5
	Trichlorofluoromethane	ND	ND	ND	ND	0.5
	1,1-Dichloroethene	ND	ND	1.3	ND	0.5
	1,1-Dichloroethane	ND	ND	2.4	ND	0.5
	trans-1,2-Dichloroethene	ND	ND	5.2 n	ND	0.5
	Chloroform	ND	4.2	ND	ND	0.5
	1,2-Dichloroethane	ND	ND	ND	ND	0.5
	1,1,1-Trichlorosthans	ND	1.0	n ND	ND	0.5
	Carbon Tetrachloride	ND	ND	ND	ND	0.5
	Bromodichloromethane	ND	ND	ND	ND	0.5
	1,2-Dichloropropane	ND	ND	ND	ND	ા.5
	trans-1,3-Dichloropropene	ND	ND	ND	ND	0.5
	Trichloroethene	ND	ND	7.6	ND	ા. 5
1	Dibromochloromethane	ND	ND	ND	ND	0.5
1	1,1,2-Trichloroethane	ND	ПN	ND	ND	0.5
1	cis-1,3-Dichloropropene	ND	ND	ND	ND	0.5
	2-Chloroethylvinylether	ND	ND	ND	ND	0.5
	Bromoform	ND	ND	ND	ND	0.5
2	1,1,2,2-Tetrachloroethane	ND	ND	2.5 n	ND	ે.5
	Tetrachloroethene	ND	ND	2.5	ND	0.5
	Chlorobenzene	ND	ND	ND	ND	0.5
3	Dichlorobenzenes	ND	ND	ND	ND	0.5

Analysis date:	11/19/86	11/19/86	11/18/86	11/18/86
Surrogate Recovery %:	104	110	58	76
Detection limit factor:	1.00	1.00	1.00	1.00

^{1 -} these compounds coelute ND - not detected at detection limit times factor 2 - these compounds coelute a - below normal laboratory background levels

^{3 -} mixture of isomers and coelute

n - not found in confirmation run 4 - these compounds compute

Table 1. Analysis Type: 601 Results (continued)

	Sample Type:	LAN		LAN		LAN	DET	
	Sample ID#:	000775	_	000776		000777	999999	
	Compound	Concentration ug/L						
	Chloromethane	ND		ND.		ND	0.5	
	Bromomethane	ND		ND		ND	0.5	
4	Dichlorodifluoromethane	ND		ND		ND	0. <b>5</b>	
4	Vinyl Chloride	ND		ND		ND	0.5	
	Chloroethane	ND		ND		ND	0.5	
	Methylene Chloride	7.2	a	6.6	a	6.8 a	0.5	
	Trichlorofluoromethane	ND		ND		ND	0.5	
	1,1-Dichloroethene	ND		ND		ND	0.5	
	1,1-Dichloroethane	ND		ND		ND	0.5	
	trans-1,2-Dichloroethene	ND		ND		ND	0.5	
	Chloroform	ND		ND		ND	0.5	
	1.2-Dichloroethane	ND		ND		ND	0.5	
	1,1,1-Trichloroethane	0.6	n	3.3	q	ND	0.5	
	Carbon Tetrachloride	ND		ND		ND	0.5	
	Bromodichloromethane	ND		DM		ND	0.5	
	1,2-Dichloropropane	ND		ND		ND	0.5	
	trans-1,3-Dichloropropene	ND		ND		ND	0.5	
	Trichlorgethene	ND		ND		ND	0.5	
1	Dibromochloromethane	ND		ND		ND	0.5	
1	1,1,2-Trichloroethane	ND		ND		ND	0.5	
1	cis-1,3-Dichloropropene	ND		ND		ND	0.5	
	2-Chloroethylvinylether	ND		ND		ND	0.5	
	Bromoform	ND		ND		ND	0.5	
2	1,1,2,2-Tetrachloroethane	ND		ND		ND	0.5	
2	Tetrachloroethene	ND		ND		ND	0.5	
	Chlorobenzene	ND		ND		ND	0.5	
3	Dichlorobenzenes	ND		ND		ND	0.5	

Detection limit factor:	1.00	1.00	1.00
Surrogate Recovery %:	89	79	81
Analysis date:	11/19/86	11/19/86	11/19/86

^{1 -} these compounds coelute ND - not detected at detection limit times factor 2 - these compounds coelute a - below normal laboratory background levels

^{3 -} mixture of isomers and communities q - confirmation not run 4 - these compounds communities n - not found in confirmation run

Table 2. Analysis Type: 601 QA

Sample Type: Sample ID#:	MB1 999998	MB2 99998	581 99998	LDU 090774	DET 499499
Compound		Concer	itration ug/	L	
Chloromethane	ND	ND	ND	ND	9.5
Bromomethane	ND	ND	ПD	ND	0.5
4 Dichlorodifluoromethane	ND	ND	ND	ND	4,5
4 Vinyl Chloride	ND	ND	ND	ND	0.5
Chioroethane	ND	ND	ND	ND	0.5
Methylene Chloride	1.5 a	0.6 a	ND	7.4 a	0.5
Trichlorofluoromethane	ND	ND	ND	ND	0.5
1,1-Dichloraethene	ND	ND	ND	ND	).5
1,1-Dichloroethane	ND	ND	ND	ND	0.5
trans-1,2-Dichloroethene	ND	ND	ND	ND	0.5
Chloroform	ND	ND	ND	ND	0.5
1,2-Dichloroethane	ND	ND	ND	ND	0.5
1,1,1-Trichloroethane	ND	ND	ND	ND	0.5
Carbon Tetrachloride	ND	ND	מא	ND	0.5
Bromodichloromethane	ND	ND	ND	ND	:.5
1,2-Dichloropropane	ND	ND	ND	ND	€.5
trans-1.3-Dichloropropene	ND	ND	ND	ND	:.5
Trichloroethene	ND	ND	NÐ	ND	
1 Dibromochloromethane	ND	ND	ND	ND	7.5
1 1,1,2-Trichloroethane	ND	ND	ND	ND	2.5
1 cis-1,3-Dichloropropene	ND	ND	ND	ND	ં.5
2-Chloroethylvinylether	ND	ND	ND	ND	>.5
Bromoform	ND	ND	ND	ND	1.5
2 1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	0.5
2 Tetrachloroethene	ND	ND	ND	ND	0.5
Chlorobenzene	ND	ND	ND	ND	0.5
3 Dichlorobenzenes	ND	ND	ND	ND	0.5

Detection limit factor:	1.00	1.00	1.00	1.00
Surrogate Recovery %:	84	73	61	79
Analysis date:	11/18/86	11/19/86	11/19/86	11/19/86

^{1 -} these compounds coelute ND - not detected at detection limit times factor 2 - these compounds coelute a - below normal laboratory background levels

^{3 -} mixture of isomers and coelute

^{4 -} these compounds coelute





Energy & Environmental Division

AeraViranment 825 Myrtle Avenue Monrovia, Ca 91016

December 4, 1986 Acurex ID#: 8611-044 File 6011144A

Attention: Chris Lovdahl

Subject: Analysis of Eleven Water Samples

for Volatile Halogenated Organics, Received 11/17/86

Eleven water samples were analyzed for volatile halogenated organics according to EFA Method 601 (Federal Register, Volume 49 #209, October 26, 1984; page 29). Results are presented in Table 1. Quality assurance data is presented in Table 2. The method can be summarized as follows:

> Helium is bubbled through a volume of water contained in a specially designed purging chamber at ambient temperature. The purgable halogenated organic compounds are efficiently transferred from the aqueous phase to the vapor phase. The vapor is swept through a sorbent column where the purgeables are trapped. After purging is completed, the sorbent column heated and back flushed with helium to desorb the purgeables onto a gas chromatographic column. The gas chromatograph is temperature programmed to separate the purgeable which are then detected with a Hall detector run in series with a photoionization detector. SP-1000 on Carbopak B is used for the primary analysis. Confirmations are run using a Hall detector alone and a column containing n-octane on Porasil C.

If you should have any questions, please do not hesitate to call.

Submitted by:

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Staff Chemist

Project Chemist

Table 1. Analysis Type: 601 Results

	Sample Type: Sample ID#:	LAN 000778	LAN 000779	LAN 000780	LAN 000781	DET 99999
	Compound		Conce	ntration ug/l		
	Chloromethane	ND	ND	ND	ND	0.5
	Bromomethane	ND	ND	ND	ND	0.5
4	Dichlorodifluoromethane	ND	ND	ND	ND	0.5
4	Vinyl Chloride	ND	ND	ND	ND	ა.5
	Chloroethane	ND	ND	ND	ND	0.5
	Methylene Chloride	7.5 a	5.2 a	7.4 a	8.0 a	0.5
	Trichlorofluoromethane	ND	ND	ND	ND	0.5
	1,1-Dichloroethene	ND	ND	ND	ND	0.5
	1,1-Dichloroethane	ND	ND	ND	ND	0.5
	trans-1,2-Dichloroethene	ND	DN	ND	ND	0.5
	Chloroform	ND	ND	ND	ND	0.5
	1,2-Dichloroethane	ND	ND	ND	ND	0.5
	1,1,1-Trichloroethane	ND	0.7 n	ND	0.9 n	0.5
	Carbon Tetrachloride	ND	ND	ND	ND	0.5
	Bromodichloromethane	ND	ND	ND	ND	0.5
	1,2-Dichloropropane	ND	ND	ND	ND	9.5
	trans-1,3-Dichloropropene	ND	ND	ND	ND	ე.5
	Trichlorgethene	ND	ND	ND	ND	0.5
1	Dibromochloromethane	ND	ND	ND	ND	0.5
1	1,1,2-Trichloroethane	ND	ND	ND	ND	0.5
	cis-1,3-Dichloropropene	ND	ND	ND	ND	0.5
	2-Chloroethylvinylether	ND	ND	ND	ND	0.5
	Brosofore	ND	ND	ND	ND	0.5
2	1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	0.5
	Tetrachloroethene	ND	ND	ND	ND	0.5
_	Chlorobenzene	ND	ND	ND	ND	ა.5
3	Dichlorobenzenes	ND	ND	ND	ND	J.5

Analysis date:	11/19/86	11/19/86	11/19/86	11/19/86
Surrogate Recovery %:	101	74	92	93
Detection limit factor:	1.00	1.00	1.00	1.00

^{1 -} these compounds coelute ND - not detected at detection limit times factor 2 - these compounds coelute a - below normal laboratory background levels

^{3 -} mixture of isomers and coelute

n - not found in confirmation run 4 - these compounds comlute

Table 1. Analysis Type: 601 Results (continued)

	Sample Type: Sample ID#:	LAN 000783	LAN 000784	LAN 000785	LAN 000786	DET 99999
	Compound		Concer	itration ug/	L	
	Chloromethane	ND	ND	ND	ND	3.5
	Bromomethane	ND	ND	ND	ND	0.5
4	Dichlorodifluoromethane	ND	ND	ND	ND	) <b>.</b> 5
4	Vinyl Chloride	ND	ND	ND	ND	0.5
	Chloroethane	ND	ND	ND	ND	ે.5
	Methylene Chloride	15.0 a	18.0 a	2.3 a	ND	0.5
	Trichlorofluoromethane	ND	ND	ND	ND	0.5
	1,1-Dichloroethene	ND	ND	ND	ND	ა.5
	1,1-Dichloroethane	ND	ND	ND	ND	0.5
	trans-1,2-Dichloroethene	ND	ND	ND	ND	0.5
	Chloroform	םא	ND	מא	ND	ા.5
	1,2-Dichloroethane	ND	ND	ND	ND	0.5
	1,1,1-Trichloroethane	ND	ND	ND	ND	).5
	Carbon Tetrachloride	ND	ND	ND	ND	0.5
	Bromodichloromethane	ND	ND	ND	ND	⊹.5
	1,2-Dichloropropane	ND	ND	ND	ND	0.5
	trans-1,3-Dichloropropene	ND	ND	ND	ND	0.5
	Trichloroethene	ND	ND	ND	ND	0.5
1	Dibromochloromethane	ND	ND	ND	ND	.5
1	1,1,2-Trichloroethane	ND	ND	ND	ND	0.5
1	cis-1,3-Dichloropropene	ND	ND	ND	ND	0.5
	2-Chloroethylvinylether	ND	ND	ND	ND	>.5
	Bromoform	ND	ND	ND	ND	ં.5
2	1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	0.5
	Tetrachloroethene	ND	ND	ND	ΝD	0.5
	Chlorobenzene	ND	ND	ND	ND	0.5
3	Dichlorobenzenes	ND	ND	ND	ND	0.5

Surrogate Recovery %:	82	85	91	72
Analysis date:	11/19/86	11/20/86	11/20/86	11/20/86

^{1 -} these compounds coelute ND - not detected at detection limit times factor 2 - these compounds coelute a - below normal laboratory background levels 3 - mixture of isomers and coelute

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^{4 -} these compounds coelute

Aerovironment 8611-044 File 6011144A

Table 1. Analysis Type: 601 Results (continued)

	Sample Type: Sample ID#:	LAN 0007 <b>87</b>	LAN 000788	LAN 000789	DET 999999
	Compound		Concer	tration ug/	L
	Chloromethane	ND	ND	ND	0.5
	Bromomethane	ND	ND	ND	0.5
4	Dichlorodifluoromethane	0.7 n	ND	ND	0.5
	Vinyl Chloride	0.7	ND	ND	0.5
	Chloroethane	ND	ND	ПN	0.5
	Methylene Chloride	ND	ND	1.6 a	0.5
	Trichlorofluoromethane	ND	ND	ND	0 <b>.5</b>
	1,1-Dichloroethene	ND	ND	ND	0.5
	1,1-Bichloroethane	ND	ND	ND	0 <b>.5</b>
	trans-1,2-Dichloroethene	ND	ND	ND	0.5
	Chloroform	ND	ND	ИD	0.5
	1,2-Dichloroethane	ND	ND	ND	0.5
	1,1,1-Trichloroethane	ND	ND	1.0	0.5
	Carbon Tetrachloride	ND	ND	ND	0.5
	Bromodichloromethane	ND	ND	ND	0.5
	1,2-Dichloropropane	ND	ND	ND	0.5
	trans-1,3-Dichloropropene	ND	ND	ND	0.5
	Trichloroethene	2.6	ND	0 <b>.9</b>	0.5
1	Dibromochloromethane	ND	ND	ND	0.5
1	1,1,2-Trichloroethane	ND	ND	ND	0.5
1	cis-1,3-Dichloropropene	ND	ND	ND	0.5
	2-Chloroethylvinylether	ND	ND	ND	0.5
	Bromoform	ND	ND	an	0.5
2	1,1,2,2-Tetrachloroethane	1.0 n	ND	ND	0.5
2	Tetrachloroethene	1.0 n	ND	ND	0.5
	Chlorobenzene	ND	ND	ND	0.5
3	Dichlorobenzenes	ND	ND	ND	0.5

Analysis date:	11/21/86	11/20/86	11/20/86
Surrogate Recovery %:	71	67	74
Detection limit factor:	1.00	1.00	1.00

^{1 -} these compounds compute ND - not detected at detection limit times factor 2 - these compounds compute a - below normal laboratory background levels

^{3 -} mixture of isomers and coelute

^{4 -} these compounds coelute n - not found in confirmation run

Table 2. Analysis Type: 601 QA

Sample Type: Sample ID#:	MB1 999998	MB2 999998	MB3 999998	5B1 999998	DET 999999
Compound		Concer	itration ug.	/L	
Chloromethane	ND	ND	ND	ND	0.5
Bromomethane	ND	ND	ND	ND	5
4 Dichlorodifluoromethane	ND	ND	ND	ND	0.5
4 Vinyl Chloride	ND	ND	ND	ND	0.5
Chloroethane	ND	ПN	ND	ND	9.5
Methylene Chloride	0.6 a	0.7 a	ND	ND	0.5
Trichlorofluoromethane	ND	МD	ND	ND	0.5
1,1-Dichloroethene	ND	ND	ND	ND	្.5
1,1-Dichloroethane	ND	ND	ND	ND	0.5
trans-1,2-Dichloroethene	ND	ND	ND	ND	0.5
Chloroform	ND	ND	ND	ND	0.5
1,2-Dichloroethane	ND	ND	ND	ND	<b>া.</b> 5
1,1,1-Trichloroethane	ND	ND	ND	ND	0.5
Carbon Tetrachloride	ND	ND	ND	ND	0.5
Bromodichloromethane	ND	ND	ND	ND	9.5
1,2-Dichloropropane	ND	ND	ND	ND	1.5
trans-1,3-Dichloropropene	ПD	ND	ND	ND	0.5
Trichloroethene	ND	DN	ND	ND	ა.5
1 Dibromochloromethane	ND	ND	ND	ND	0.5
1 1,1,2-Trichloroethane	ND	ND	ND	ND	∴.5
1 cis-1,3-Dichloropropene	ND	ND	ND	ND	0.5
2-Chloroethylvinylether	ND	ND	ND	ND	:.5
Bromoform	ND	ND	ND	ND	0.5
2 1,1,2,2-Tetrachloroethane	ND	ND	ND	מא	0.5
2 Tetrachloroethene	ND	ND	ND	ND	0.5
Chlorobenzene	ND	ND	ND	ND	0.5
3 Dichlorobenzenes	ND	ND	ND	ND	0.5

Detection limit factor:	1.00	1.00	1.00	1.00
Surrogate Recovery %:	73	51	62	52
Analysis date:	11/19/84	11/20/86	11/21/86	11/20/86

^{1 -} these compounds coelute ND - not detected at detection limit times factor 2 - these compounds coelute a - below normal laboratory background levels

^{3 -} mixture of isomers and coelute

^{4 -} these compounds coelute

Table 2. Analysis Type: 601 QA (continued)

	Sample Type:	LDU	LSP	MSL	DET
	Sample ID#:	000785	000784	000784	999999
	Compound		Conce	entration ug/	L
	Chloromethane	ND	45 %	10 s	ે.5
	Bromomethane	ND	83 7	10 s	0.5
4	Dichlorodifluoromethane	ND	104 %	10 5	9.5
4	Vinyl Chloride	ND	104 7	10 s	0.5
	Chloroethane	ND	127 %	10 5	ú <b>.5</b>
	Methylene Chloride	1.1 a	26 7	5 5	0.5
	Trichlorofluoromethane	ND	102 7	10 5	0.5
	1,1-Dichloroethene	ND	100 7	ξ 5 s	0.5
	1,1-Dichloroethane	ND	128 7	5 5	0.5
	trans-1,2-Dichloroethene	ND	93 7	, 5 s	0.5
	Chloroform	ND	130 7	. 5 s	0.5
	1.2-Dichloroethane	ND	138 7	% 5 s	0.5
	1,1,1-Trichloroethane	ND	95 7	. 5 s	0.5
	Carbon Tetrachloride	ND	90	X 5 s	0.5
	Bromodichloromethane	ND	92 7	. 5 s	0.5
	1,2-Dichloropropane	ND	92	X 5 s	0.5
	trans-1,3-Dichloropropene	ND	84 7	% 5 s	0.5
	Trichloroethene	ND	74	% 5 s	0.5
1	Dibromochloromethane	ND	83 7	. 5 s	0.5
1	1.1.2-Trichloroethane	ND	83 1	% 5 s	0.5
1	cis-1.3-Dichloropropene	ND	83 7	% 5 s	0.5
	2-Chloroethylvinylether	ND	ND	5 s	0.5
	Bromoform	ND	64	% 5 s	0.5
2	1,1,2,2-Tetrachloroethane	ND	6 <b>6</b> '	7. 5 s	0.5
	Tetrachloroethene	ND	6 <b>6</b>	% 5 <b>s</b>	0.5
_	Chlorobenzene	ND	65		0.5
3	Dichlorobenzenes	ND	31	15 s	0.5

Detection limit factor: 1.00 1.00

Surrogate Recovery %: 79 100

Analysis date: 11/20/86 11/20/86

^{1 -} these compounds coelute ND - not detected at detection limit times factor 2 - these compounds coelute a - below normal laboratory background levels

^{3 -} mixture of isomers and coelute

^{4 -} these compounds coelute s - amount spiked in smple

^{% -} percent recovery from spiked sample



DEC 1: DEG

Energy & Environmental Division

AeroVironment 825 Myrtle Avenue Monrovia, Ca 91016 December 5, 1986 Acurex ID#: 8611-047 File 6011147A

Attention: Chris Lovdahl

Subject: Analysis of Six Water Samples

for Volatile Halogenated Organics, Received 11/18/86

Six water samples were analyzed for volatile halogenated organics according to EPA Method 601 (Federal Register, Volume 49 #209, October 26, 1984; page 29). Results are presented in Table 1. Quality assurance data is presented in Table 2. The method can be summarized as follows:

> Helium is bubbled through a volume of water contained in a specially designed purging chamber at ambient temperature. The purgable halogenated organic compounds are efficiently transferred from the aqueous phase to the vapor phase. The vapor is swept through a sorbent column where the purgeables are trapped. After purging is completed, the sorbent column heated and back flushed with helium to desorb the purgeables anto a gas chromatographic column. The gas chromatograph is temperature programmed to separate the purgeable which are then detected with a Hall detector run in series with a photoconization detector. SP-1000 on Carbopak B is used for the primary analysis. Confirmations are run using a Hall detector alone and a column containing n-octane on Porasil C.

If you should have any questions, please do not hesitate to call.

Submitted by: Such Schoen, Stran Schoen, Ph.D.

Staff Chemist

Project Chemist

Table 1. Analysis Type: 601 Results

	Sample Type: Sample ID#:	LAN 000790	LAN 000791	LAN 000792	LAN 000793	DET 99999
	Compound		Concer	ntration ug/	l.	
	Chloromethane	ND	ND	ND	ND	).5
	Bromomethane	ND	ND	ND	ND	ે.5
4	Dichlorodifluoromethane	ND	ND	ND	ND	0.5
4	Vinyl Chloride	ND	ND	ND	ND	0.5
	Chloroethane	ND	ND	ND	ND	0.5
	Methylene Chloride	ND	3.0 a	6.5 a	ND	0.5
	Trichlorofluoromethane	ND	ND	ND	ND	0.5
	1,1-Dichloroethene	ND	ND	ND	ND	0.5
	1,1-Dichloroethane	ND	ND	ND	ND	0.5
	trans-1,2-Dichloroethene	ND	ND	ND	ND	0.5
	Chloroform	ND	ND	ND	ND	0.5
	1,2-Dichloroethane	ND	ND	ND	ND	0.5
	1,1,1-Trichloroethane	ND	ND	ND	ND	0.5
	Carbon Tetrachloride	ND	MD	ND	ND	0.5
	Bromodichloromethane	ND	ND	ND	ND	0.5
	1,2-Dichloropropane	ND	ND	ND	ND	0.5
	trans-1,3-Dichloropropene	ND	ND	ND	ND	0.5
	Trichloroethene	ND	ND	ND	ND	0.5
1	Dibromochloromethane	ND	ND	ND	ND	0.5
1	1,1,2-Trichloroethane	ND	ND	ND	ND	0.5
	cis-1,3-Dichloropropene	ND	ND	ND	ND	0.5
	2-Chloroethylvinylether	ND	ND	ND	ND	0.5
	Bromoform	ND	ND	ND	ND	0.5
2	1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	).5
	Tetrachloroethene	ND	ND	ND	ND	0.5
-	Chlorobenzene	ND	ND	ND	ND	} <b>.</b> 5
3	Dichlorobenzenes	ND	ND	ND	ND	0.5

Detection limit factor:	1.00	1.00	1.00	1.00
Surrogate Recovery %:	85	77	101	66
Analysis date:	11/20/86	11/21/86	11/21/86	11/21/86

^{1 -} these compounds coelute ND - not detected at detection limit times factor 2 - these compounds coelute a - below normal laboratory background levels

^{3 -} mixture of isomers and coelute

^{4 -} these compounds coelute

Table 1. Analysis Type: 601 Results (continued)

	Sample Type:	LAN	LAN	DET		
	Sample ID#:	000794	000795	999999		
	Compound	Concentration ug/L				
	Chloromethane	ND	ND	0.5		
	Bromomethane	ND	ND	0.5		
4	Dichlorodifluoromethane	ND	ND	0.5		
4	Vinyl Chloride	ND	ND	0.5		
	Chloroethane	ND	ND	0.5		
	Methylene Chloride	2.8 a	0.9 a	0.5		
	Trichlorofluoromethane	ND	ND	0.5		
	1.1-Dichloroethene	ND	ND	0.5		
	1,1-Dichloroethane	ND	ND	0.5		
	trans-1,2-Dichloroethene	מא	ND	0.5		
	Chloroform	ND	ND	0.5		
	1,2-Dichloroethane	ND	ND	0.5		
	1,1,1-Trichloroethane	ND	ND	0.5		
	Carbon Tetrachloride	ND	מא	0.5		
	Bromodichloromethane	ND	ND	0.5		
	1,2-Dichloropropane	ND	ND	0.5		
	trans-1,3-Dichloropropene	ND	ND	0.5		
	Trichloroethene	ND	ND	∂.5		
1	Dibromochloromethane	ND	ND	0.5		
1	1,1,2-Trichloroethane	ND	ND	0.5		
1	cis-1.3-Dichloropropene	ND	ND	0.5		
	2-Chloroethylvinylether	ND	ND	0.5		
	Bromoform	ND	ND	0.5		
2	1,1,2,2-Tetrachloroethane	ND	ND	0.5		
	Tetrachloroethene	ND	ND	0.5		
	Chlorobenzene	ND	ND	0.5		
3	Dichlorobenzenes	ND	ND	0.5		

Detection limit factor:	1.00	1.00
Surrogate Recovery %:	110	81
Analysis date:	11/21/86	11/21/84

^{1 -} these compounds compute ND - not detected at detection limit times factor 2 - these compounds compute a - below normal laboratory background levels

^{3 -} mixture of isomers and coelute

^{4 -} these compounds coelute

Table 2. Analysis Type: 601 QA

	Sample Type: Sample ID#:	MB1 999998	MB2 999998	MB3 99998	L <b>DU</b> 0007 <b>9</b> 3	DE~ 9 <b>99</b> 999
	Compound		Concer	ntration ug/l	•	
	Chloromethane	ND	ND	ND ND	ND	 3,5
	Bromomethane	ND	ND	ND	ND	7.5
4	Dichlorodifluoromethane	ND	ND	ND	ND	9.5
4	Vinyl Chloride	ND	ND	ND	ND	∮ <b>.</b> 5
	Chloroethane	ND	ND	ND	ND	0.5
	Methylene Chloride	0.7 a	ND	0.9 a	0.8 a	0.5
	Trichlorofluoromethane	ON	ND	ND	ND	0.5
	1,1-Dichloroethene	ND	ND	ND	ND	0.5
	1.1-Dichloroethane	ND	ND	ND	ND	0.5
	trans-1,2-Dichloroethene	ND	ND	ND	ND	0.5
	Chloroform	ND	ND	ND	ND	0.5
	1,2-Dichloroethane	ND	ND	ND	ND	0.5
	1.1.1-Trichloroethane	ND	ND	ND	ND	0.5
	Carbon Tetrachloride	ND	ND	ND	ND	1.5
	Bromodichloromethane	ND	ND	ND	ND	0.5
	1,2-Dichloropropane	ND	ND	ND	ND	9.5
	trans-1.3-Dichloropropene	ND	ND	DM	ND	).5
	Trichloroethene	ND	ND	ND	ND	) <b>.</b> 5
	Dibromochloromethane	ND	ND	ND	ND	0.5
	1,1,2-Trichloroethane	ND	ND	ND	ND	0.5
1	cis-1,3-Dichlaropropene	ND	ND	ND	ND	0.5
	2-Chloroethylvinylether	ND	ND	ND	ND	ა.5
	Bromoform	ND	ND	ND	ND	0.5
	1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	0.5
2	Tetrachloroethene	ND	ND	ND	ND	0.5
	Chlorobenzene	ND	ND	ND	ND	0.5
3	Dichlorobenzenes	ND	ND	ND	ND	0.5

Detection limit factor:	1.00	1.00	1.00	1.00
Surrogate Recovery %:	51	62	68	107
Analysis date:	11/20/86	11/21/86	11/24/86	11/24/86

^{1 -} these compounds coelute 2 - these compounds coelute ND - not detected at detection limit times factor a - below normal laboratory background levels

^{3 -} mixture of isomers and coelute

^{4 -} these compounds coelute



Energy & Environmental Division

AeroVironment \$25 Myrtle Avenue Monrovia, Ca 91016 December 4, 1986 Acurex ID#: 8611-950 File 60111504

Attention: Chris Lovdahl

Subject: Analysis of Six water Samples

for Volatile Halogenated Organics, Received 11/19/96

Sim water samples were analyzed for volatile halogenated organics according to EPA Method 501 (Federal Register, Volume 49 #209, October 26, 1984; mage 29). Results are presented in Table 1. Quality assurance data is presented in Table 2. The method can be summarized as follows:

> Helium is bubbled through a volume of water contained in a specially designed purging chamber at ambient temperature. The purgable halogenated organic compounds are efficiently transferred from the aqueous phase to the vapor phase. The vapor is swept through a sorbent column where the purgeables are trapped. After purging is completed, the surbent column neated and back flushed with helium to desorb the purgeables unto a gas enromatographic column. The gas chromatograph is temperature programmed to separate the purgeable which are then detected with a Hall detector run in series with a andtolonization detector. SP~1000 on Carbopak B is used for the primary ar lysis. Confirmations are run using a Hall detector alone and a column containing n-octane on Porasil C.

If you should have any questions, please do not hesitate to call.

Submitted by: Sarah Schoen, Ph.D.

6/10 F/G 24/4 UNCLASSIFIED

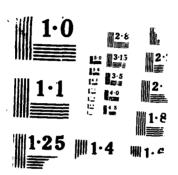


Table 1. Analysis Type: 601 Results

Sample	ID#:	000796						DET
				000797		000798	000799	999999
Compound	d			Cond	ent	ration ug/	L	
Chloros	ethane	ND		ND	_	ND	ND	0.5
Bromome	thane	ND		ND		ND	ND	0.5
4 Dichlor	odifluoromethane	ND		ND		9.9 n	9.4 n	0.5
4 Vinyl C	nloride	ND		ND		9.9	9.4	0.5
Chloroe		ND		ND		ND	ND	0.5
Methyles	ne Chloride	1.4	a	1.2	a	ND	ND	0.5
•	rofluoromethane	ND		ND		ND	ND	0.5
1.1-Dict	hloroethene	ND		ND		ND	ND	0.5
,	hloroethane	ND		ND		0.9	0.9	0.5
•	,2-Dichloroethene	ND		ND		2.6 n	2.6 n	0.5
Chlorof	•	ND		0.6	n	ND	ND	0.5
	hloroethane	ND		ND		2.5	2.8	0.5
•	richloroethane	ND		ND		ND	ND	0.5
, ,	Tetrachloride	ND		ND		ND	ND	0.5
	chloromethane	ND		ND		ND	ND	0.5
	hloropropane	ND		ND		1.0	1.2	0.5
	,3-Dichloropropene	ND		ND		ND	ND	0.5
	roethene	13		ND		22	21	0.5
<del>-</del>	chloromethane	ND		ND		ND	ND	0.5
	richloroethane	ND		ND		ND	ND	0.5
	-Dichloropropene	ND		ND		ND	ND	0.5
•	oethylvinylether	ND		ND		ND	ND	0.5
Bromofo		ND		ND		ND	ND	0.5
	-Tetrachloroethane	3.6	n	ND		2.7 n	2.6 n	0.5
	loroethene	3.6	••	ND		2.7	2.6	0.5
Chlorob		ND		ND		ND	ND	0.5
3 Dichlor		D		ND		1.2 n	1.2 n	0.5

Detection limit factor: Surrogate Recovery %:	1.00	1.00 7 <b>9</b>	110	102
Analysis date:		11/21/86	11/24/86	11/24/86

^{1 -} these compounds compute ND - not detected at detection limit times factor 2 - these compounds compute a - below normal laboratory background levels

^{3 -} mixture of isomers and complute

^{4 -} these compounds complete in - not found in confirmation run

Table 1. Analysis Type: 601 Results (continued)

	Sample Type: Sample ID#:	LAN 000800	LAN 000801	DET 999999
	Compound	Con	centration	ug/L
	Chloromethane	ND	D	0.5
	Bromomethane	ND	ND	0.5
4	Dichlorodifluoromethane	מא	ND	0.5
4	Vinyl Chloride	מא	ND	0.5
	Chloroethane	ND	ND	0.5
	Methylene Chloride	1.3	a 2.4	a 0.5
	Trichlorofluoromethane	ND	ND	0.5
	1,1-Dichloroethene	ND	ND	0.5
	1,1-Dichloroethane	ND	ND	0.5
	trans-1,2-Dichloroethene	ND	ND	0.5
	Chloroform	ND	2.5	0.5
	1,2-Dichloroethane	ND	ND	0.5
	1,1,1-Trichloroethane	ND	2.5	n 0.5
	Carbon Tetrachloride	ND	ND	0.5
	Bromodichloromethane	ND	ND	0.5
	1,2-Dichloropropane	ND	ND	0.5
	trans-1,3-Dichloropropene	ND	מא	0.5
	Trichloroethene	ND	ND	0.5
1	Dibromochloromethane	ND	ND	0.5
1	1,1,2-Trichloroethane	ND	ND	0.5
1	cis-1,3-Dichloropropene	ND	ND	0.5
	2-Chloroethylvinylether	ND	ND	0.5
	Bromoform	ND	ND	0.5
2	1,1,2,2-Tetrachloroethane	ND	ND	0.5
7	Tetrachloroethene	ND	ND	0.5
	Chlorobenzene	ND	ND	0.5
3	Dichlorobenzenes	ND	ND	0.5

Detection limit factor:	1.00	1.00
Surrogate Recovery %:	77	78
Analysis date:	11/21/86	11/21/86

ND - not detected at detection limit times factor 1 - these compounds complute

^{2 -} these compounds combute a - below normal laboratory background levels

^{3 -} mixture of isomers and complute

^{4 -} these compounds coelute n - not found in confirmation run

Table 2. Analysis Type: 601 QA

	Sample Type: Sample ID#:	MB1 999998	MB2 999998	SB1 999998	000801	DET 9 <b>99</b> 99
	Compound		Conce	ntration ug	'L	
	Chloromethane	ND	ND	ND	ND	ა.5
	Bromomethane	ND	ND	ND	ND	0.5
4	Dichlorodifluoromethane	ND	ND	ND	ND	0.5
4	Vinyl Chloride	ND	ND	ND	ND	0.5
	Chloroethane	ND	ND	ND	ND	0.5
	Methylene Chloride	ND	0.9 a	ND	2.3 a	0.5
	Trichlorofluoromethane	ND	ND	ND	ND	0.5
	1,1-Dichloroethene	ND	ND	ND	ND	0.5
	1,1-Dichloroethane	ND	ND	ND	ND	0.5
	trans-1,2-Dichloroethene	ND	ND	ND	ND	0.5
	Chloroform	ND	ND	ND	2.3	0.5
	1,2-Dichloroethane	ND	ND	ND	ND	0.5
	1,1,1-Trichloroethane	ND	ND	ND	ND	0.5
	Carbon Tetrachloride	ND	ND	ND	ND	0.5
	Bromodichloromethane	ND	ND	ND	ND	0.5
	1,2-Dichloropropane	ND	ND	ND	ND	0.5
	trans-1,3-Dichloropropene	ND	ND	ND	ND	0.5
	Trichloroethene	ND	ND	ND	ND	0.5
1	Dibromochloromethane	ND	ND	ND	ND	0.5
1	1,1,2-Trichloroethane	ND	ND	ND	MD	<b>া.</b> 5
	cis-1,3-Dichloropropene	ND	ND	ND	ND	0.5
	2-Chloroethylvinylether	ND	NO	ND	ND	0.5
	Bromoform	MD	ND	ND	ND	ŭ.5
2	1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	0.5
	Tetrachloroethene	ND	ND	ND	ND	0.5
	Chlorobenzene	ND	ND	ND	ND	0.5
3	Dichlorobenzenes	ND	ND	ND	ND	0.5

Detection limit factor:	1.00	1.00	1.00	1.00
Surrogate Recovery %:	62	68	87	72
Analysis date:	11/21/86	11/24/86	11/24/86	11/22/86

^{1 -} these compounds coelute ND - not detected at detection limit times factor 2 - these compounds coelute a - below normal laboratory background levels

^{3 -} mixture of isomers and coelute

^{4 -} these compounds coelute

AeroVironment 8611-050 File 60111508

Table 2. Analysis Type: 601 QA (continued)

	Sample Type: Sample ID#:	LSP 000801	MSL 000801	DET 999999
	Compound	Cana	centration	ug/L
	Chioromethane	160	% 10	s 0.5
	Bromomethane	140		s 0.5
4	Dichlorodifluoromethane	120	10	
	Vinyl Chloride	120		
	Chloroethane	140		s 0.5
	Methylene Chloride	72	7, 5	s 0.5
	Trichlorofluoromethane	120	% 5	s 0.5
	1,1-Dichlaraethene	120	<b>7</b> 5	0.5
	1,1-Dichloroethane	130	% 5	s 0.5
	trans-1,2-Dichloroethene	120	<b>አ</b> 5	s 0.5
	Chloroform	150	7. 5	s 0.5
	1,2-Dichloroethane	170	7. 5	s 0.5
	1,1,1-Trichloroethane	120	7. 5	s 0.5
	Carbon Tetrachloride	130	7. 5	s 0.5
	Bromodichloromethane	130	X 5	s 0.5
	1,2-Dichloropropane	120	7. 5	s 0.5
	trans-1.3-Dichloropropene	130	7. 5	s 0.5
	Trichloroethene	120 '	7. 5	s 0.5
1	Dibromochloromethane	110	7. 5	s 0.5
1	1,1,2-Trichloroethane	110	7. 5	5 0.5
1	cis-1,3-Dichloropropene	110	<b>λ</b> 5	s 0.5
	2-Chloroethylvinylether	120	7. 5	5 0.5
	Bromoform	100	<b>x</b> 5	s 0.5
2	1,1,2,2-Tetrachloroethane	110	<b>7</b> 5	\$ 0.5
2	Tetrachloroethene	110	7. 5	s 0.5
	Chlorobenzene	130	7. 5	s 0.5
3	Dichlorobenzenes	100	15	s 0.5

Detection limit factor: 1.00

Surrogate Recovery %: 136

Analysis date: 11/24/68 11/24/86

^{1 -} these compounds coelute ND - not detected at detection limit times factor 2 - these compounds coelute a - below normal laboratory background levels

^{3 -} mixture of isomers and coelute

^{4 -} these compounds coelute ship ship sample

^{% -} percent recovery from spiked sample



**Environmental Systems Division** 

AeroVironment 825 Myrtle Avenue Monrovia, Ca 91016 December 18, 1986 Acurex ID#: 8612-014 File 6011214A

Attention: Chris Lovdahl

Subject: Analysis of Four Water Samples

for Volatile Halogenated Organics, Received 12/9/86

Four water samples were analyzed for volatile halogenated organics according to EPA Method 601 (Federal Register, Volume 49 #209, October 26, 1984; page 29). Results are presented in Table 1. Quality assurance data is presented in Table 2. The method can be summarized as follows:

> Helium is bubbled through a volume of water contained in a specially designed purging chamber at ambient temperature. The purgable halogenated organic compounds are efficiently transferred from the aqueous phase to the vapor phase. The vapor is swept through a sorbent column where the purgeables are trapped. After purging is completed, the sorbent column heated and back flushed with helium to desorb the purgeables onto a gas chromatographic column. The gas chromatograph is temperature programmed to separate the purgeable which are then detected with a Hall detector run in series with a photoconization detector. SP-1000 on Carbopak B is used for the primary analysis. Confirmations are run using a Hall detector alone and a column containing n-octane on Porasil C.

If you should have any questions, please do not hesitate to call.

Submitted by: Sarah Schoen, Ph.D.

Staff Chemist

Greg Nicoll Project Chemist

Table i. Analysis Type: 601 Results

	Sample Type: Sample ID#:	LAN 000601	LAN 000602	LAN 000603	LAN 000604	DET 999999
	Compound		Concer	itration ug/	/L	
	Chloromethane	ND	ND	ND	ND	0.5
	Bromomethane	ND	ND	ND	ND	9.5
4	Dichlorodifluoromethane	ND	ND	ND	ND	0.5
4	Vinyl Chloride	ND	ND	ND	ND	9.5
	Chloroethane	ND	ND	ND	ND	0.5
	Methylene Chloride	ND	ND	ND	ND	0.5
	Trichlorofluoromethane	ND	ND	ND	ND	0.5
	1,1-Dichloroethene	ND	ND	ND	ND	0.5
	1,1-Dichloroethane	ND	ND	ND	ND	0.5
	trans-1,2-Dichloroethene	ND	ND	ND	ND	0.5
	Chloroform	ND	ND	ND	ND	0.5
	1,2-Dichloroethane	ND	ND	ND	ND	0.5
	1,1,1-Trichloroethane	ND	ND	ND	ND	0.5
	Carbon Tetrachloride	ND	ND	ND	ND	0.5
	Bromodichloromethane	ND	ND	ND	ND	0.5
	1,2-Dichloropropane	ND	ND	ND	ND	0.5
	trans-1,3-Dichloropropene	ND	ND	ND	ND	0,5
	Trichloroethene	ND	1.8	ND	ND	0.5
1	Dibromochloromethane	ND	ND	ND	ND	0.5
1	1,1,2-Trichloroethane	ND	ND	ND	ND	0.5
1	cis-1,3-Dichloropropene	ND	ND	ND	ND	0.5
	2-Chloroethylvinylether	ND	ND	ND	ND	0.5
	Bromoform	ND	ND	ND	ND	0.5
	1,1,2,2-Tetrachloroethane	ND	11 n	ND	ND	9.5
	Tetrachloroethene	ND	11	ND	ND	0.5
	Chlorobenzene	ND	ND	ND	ND	0.5
3	Dichlorobenzenes	ND	ND	ND	ND	0.5

Detection limit factor:	1.00	1.00	1.00	1.00
Surrogate Recovery %:	105	119	106	103
Analysis date:	12/11/84	12/11/84	12/11/84	12/11/86

^{1 -} these compounds coelute - ND - not detected at detection limit times factor

^{2 -} these compounds coelute a - below normal laboratory background levels

^{3 -} mixture of isomers and coelute

^{4 -} these compounds compute n - not found in confirmation run

Table 2. Analysis Type: 601 QA

	Sample Type:	MB1	SB1	DET
	Sample ID#:	999998	999998	999999
	Compound	Conce	ntration up	]/L
	Chloromethane	ND	ND	0.5
	Bromomethane	ND	ND	0.5
4	Dichlorodifluoromethane	ND	ND	0.5
4	Vinyl Chloride	ND	ND	0.5
	Chloroethane	ND	ND	0.5
	Methylene Chloride	ND	ND	0.5
	Trichlorofluoromethane	ND	ND	0.5
	1,1-Dichloraethene	ND	ND	0.5
	1,1-Dichloroethane	ND	ND	0.5
	trans-1,2-Dichloroethene	ND	ND	0.5
	Chloroform	ND	ND	0.5
	1,2-Dichloroethane	ND	ND	0.5
	1,1,1-Trichloroethane	ND	ND	0.5
	Carbon Tetrachloride	ND	ND	0.5
	Bromodichloromethane	ND	ND	0.5
	1,2-Dichloropropane	ND	ND	0.5
	trans-1,3-Dichloropropene	ND	ND	0.5
	Trichloroethene	ND	ND	0.5
	Dibromochloromethane	ND	ND	0.5
1	1,1,2-Trichloroethane	ND	NÐ	0.5
1	cis-1,3-Dichloropropene	ND	ND	0.5
	2-Chloroethylvinylether	ND	ND	0.5
	Bromoform	ND	ND	0.5
2	1,1,2,2-Tetrachloroethane	ND	ND	0.5
2	Tetrachloroethene	ND	ND	0.5
	Chlorobenzene	ND	ND	0.5
3	Dichlorobenzenes	ND	ND	0.5

Analysis date:	12/11/86	12/11/86
Surrogate Recovery %:	100	114
Detection limit factor:	1.00	1.00

^{1 -} these compounds coelute - ND - not detected at detection limit times factor

^{2 -} these compounds compute a - below normal laboratory background levels

^{3 -} mixture of isomers and coelute

^{4 -} these compounds coelute



**Environmental Systems Division** 

AgraVironment 825 Myrtie Avenue Monrovia, Ca 91016 December 22, 1986 Acure: ID#: 8612-015 File 6011215A

Attention: Chris Lovdahl

Subject: Analysis of Ten Water Samples

for Volatile Halogenated Organics, Received 12/10/86

Ten water samples were analyzed for volatile halogenated organics according to EFA Method 601 (Federal Register, Volume 49 #209, October 26, 1984; page 29). Results are presented in Table 1. Quality assurance data is presented in Table 2. The method can be summarized as follows:

> Helium is bubbled through a volume of water contained in a specially designed purging chamber at ambient temperature. The purgable halogenated organic compounds are efficiently transferred from the aqueous phase to the vapor phase. The vapor is swept through a sorbent column where the purgeables are trapped. After purging is completed, the sorbent column heated and back flushed with helium to desorb the purgeables onto a gas chromatographic column. The gas chromatograph is temperature programmed to separate the purgeable which are then detected with a Hall detector run in series with a photoionization detector. SP-1000 on Carbopak B is used for the primary analysis. Confirmations are run using a Hall detector alone and a column containing n-octane on Porasil C.

If you should have any questions, please do not hesitate to call.

Submitted by: Sarah Schoen, Ph.D.

Staff Chemist

Grea Nicoll

Project Chemist

Table 1. Analysis Type: 601 Results

	Sample Type: Sample ID#:	LAN 000605	LAN 000606	LAN 000607	LAN 000608	DET 999999	
	Compound		Concentration ug/L				
	Chloromethane	ND	ND	ND	ND	0.5	
	Bronnethane	ND	ND	ND	ND	0.5	
4	Dichlorodifluoromethane	ND	ND	ND	ND	0.5	
	Vinyl Chloride	ND	ND	ND	ND	0.5	
٠	Chloroethane	ND	ND	ND	ND	0.5	
	Methylene Chloride	ND	ND	ND	1.1 a	0.5	
	Trichlorofluoromethane	ND	ND	ND	ND	0.5	
	1,1-Dichloroethene	ND	ND	ND	0.6 n	0.5	
	1,1-Dichloroethane	ND	ND	ND	0.9	0.5	
	trans-1,2-Dichloroethene	ND	ND	2.5 n	3.5 n	0.5	
	Chloroform	ND	ND	ND	ND	0.5	
	1,2-Dichloroethane	ND	ND	ND	ND	0.5	
	1,1,1-Trichloroethane	ND	ND	ND	ND	0.5	
	Carbon Tetrachloride	ND	ND	ND	ND	0.5	
	Bromodichloromethane	ND	ND	ND	ND	0.5	
	1,2-Dichloropropane	ND	ND	ND	ND	0.5	
	trans-1,3-Dichloropropene	ND	ND	ND	ND	0.5	
	Trichloroethene	ND	ND	36	64	0.5	
1	Dibromochloromethane	ND	ND	ND	ND	0.5	
_	1.1.2-Trichloroethane	ND	ND	ND	ND	0.5	
-	cis-1,3-Dichloropropene	ND	ND	N D	ND	0.5	
•	2-Chloroethylvinylether	ND	ND	ND	ND	0.5	
	Brosofors	ND	ND	ND	ND	0.5	
2	1,1,2,2-Tetrachloroethane	ND	ND	7.7 n	19 n	0.5	
	Tetrachioroethene	ND	ND	7.7	18	0.5	
•	Chlorobenzene	ND	ND	ND	ND	0.5	
3	Dichlorobenzenes	ND	ND	ND	ND	0.5	

Detection limit factor:	1.00	1.00	1.00	1.00
Surrogate Recovery %:	99	93	138	119
Analysis date:	12/11/86	12/11/86	12/19/86	12/11/86

^{1 -} these compounds coelute

ND - not detected at detection limit times factor a - below normal laboratory background levels 2 - these compounds coelute

^{3 -} mixture of isomers and coelute

n - not found in confirmation run 4 - these compounds coelute

Aero/inchment 8612-015 File 6911215A

Table 1. Analysis Type: 601 Results (cont:nued)

Sample Type: Sample ID#:	LAN 000609	LAN 000610	LAN 000611	LAN 000612	dadada DE _±
Compound		Concer	ntration ug/	'L	
Chloromethane	ND	ND	ND	CN	
Bromomethane	ND	ND	ND	ND	. 5
4 Dichlorodifluoromethane	ND	ND	ND	ND	1.5
4 Vinyl Chloride	ND	ND	ND	ND	0.5
Chloroethane	ND	ND	ND	ND	٠, ۶
Methylene Chloride	ND	ND	ND	0.6 a	Ų <b>.</b> 5
Trichlorofluoromethane	ND	ND	ND	ND	0.5
1,1-Dichloroethene	ND	ND	ND	ND	0.5
1,1-Dichloroethane	ND	ND	ND	ND	0.5
trans-1,2-Dichloroetheme	ND	ND	NÐ	NÐ	ગ.૬
Chloroform	ND	ND	ND	ND	0.5
1,2-Dichloroethane	ND	ND	ND	ND	9.5
1,1,1-Trichloroethane	ND	ND	ND	ND	0.5
Carbon Tetrachloride	ND	ND	ND	ND	0.5
Bromodichloromethane	ND	ND	ND	ND	9.€
1,2-Dichloropropane	ND	ND	ND	ND	:.5
trans-1,3-Dichloropropene	ND	ND	ND	ND	∴.5
Trichlorgethene	ND	ND	ND	ND	:.∄
1 Dibromochloromethane	ND	ND	ND	ND	0.5
1 1,1,2-Trichloroethane	ND	ND	ND	ND	).5
1 cis-1,3-Dichloropropene	ND	ND	ND	ND	0.5
2-Chloroethylvinylether	ND	ND	ND	ND	0.5
Bromoform	ND	ND	ND	ND	5
2 1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	>.⊑
2 Tetrachloroethene	ND	ПD	ND	В	. 5
Chlorobenzene	ND	ND	ND	ND	9.5
3 Dichlorobenzenes	ND	ND	ND	ND	).5

Analysis date:	12/11/86	12/11/86	12/11/86	12/12/86
Surrogate Recovery %:	109	127	95	101
Detection limit factor:	1.00	1.00	1.00	1.00

^{1 -} these compounds coelute ND - not detected at detection limit times factor 2 - these compounds coelute a - below normal laboratory background levels

^{3 -} mixture of isomers and coelute

^{4 -} these compounds coelute

Table 1. Analysis Type: 601 Results (continued)

	Sample Type: Sample ID#:	000613	LAN 000614	DET 999999
	Compound	Cance	ntration	ug/L
	Chloromethane	ND	ND	0.5
	Bromomethane	ND	ND	0.5
4	Dichlorodifluoromethane	ND	2.1	n 0.5
4	Vinyl Chloride	ND	2.1	0.5
	Chloroethane	ND	ND	0.5
	Methylene Chloride	ND	ND	0.5
	Trichlorofluoromethane	ND	ND	0.5
	1,1-Dichloroethene	ND	ND	0.5
	1,1-Dichloroethane	ND	ND	0.5
	trans-1,2-Dichloroethene	ND	3.0	n 0.5
	Chloroform	ND	ND	0.5
	1.2-Dichloroethane	ND	ND	0.5
	1,1,1-Trichloroethane	ND	ND	0.5
	Carbon Tetrachloride	ND	ND	0.5
	Bromodichloromethane	ND	DN	0.5
	1,2-Dichloropropane	ND	ND	0.5
	trans-1,3-Dichloropropene	ND	ND	0.5
	Trichloroethene	ND	11	0.5
1	Dibromochloromethane	ND	ND	0.5
1	1,1,2-Trichloroethane	ND	ND	0.5
1	cis-1,3-Dichloropropene	ND	ND	0.5
	2-Chloroethylvinylether	ND	ND	0.5
	Bromoform	ND	ND	0.5
2	1,1,2,2-Tetrachloroethane	ND	1.4	n 0.5
	Tetrachloroethene	ND	1.4	0.5
	Chlorobenzene	ND	ND	0.5
3	Dichlorobenzenes	ND	ND	0.5

Analysis date:	12/12/86	12/12/86
Surrogate Recovery %:	109	124
Detection limit factor:	1.00	1.00

^{1 -} these compounds coelute ND - not detected at detection limit times factor 2 - these compounds coelute a - below normal laboratory background levels

^{3 -} mixture of isomers and coelute

^{4 -} these compounds coelute n - not found in confirmation run

Table 2. Analysis Type: 601 QA

	Sample Type: Sample ID#:	MB1 999998	MB2 999998	MB3 999998	581 999998	3ET 999999	
	Compound	Concentration ug/L					
	Chloromethane	ND	מא	ND	ND	, 5	
	Bromomethane	ND	ND	ND	ND	: 5	
4	Dichlorodifluoromethane	ND	ND	ND	ND	=	
4	Vinvl Chloride	ND	ND	ND	ND		
	Chioroethane	ND	ND	ND	В	), ₹	
	Methylene Chloride	ND	2.1 a	ND	ND	1.5	
	Trichlorofluoromethane	ND	ND	ND	ND	0.5	
	1,1-Dichloroethene	ND	ND	ND	ND	5.5	
	1.1-Dichioroethane	ND	ND	ND	ND	0.5	
	trans-1,2-Dichloroethene	ND	ND	ND	ND	0.5	
	Chloroform	ND	ND	ND	ND	0.5	
	1,2-Dichloroethane	ND	ND	ND	ND	9.5	
	1,1,1-Trichloroethane	ND	ND	ND	חמ	0.5	
	Carbon Tetrachloride	ND	ND	ND	ND	1.5	
	Bromodichloromethane	ND	ND	ND	ND	1.5	
	1,2-Dichloropropane	ND	ND	ND	ND	. 5	
	trans-1.3-Dichloropropene	ND	ND	ND	ND	9.5	
	Trichloroethene	ND	ND	ND	ND	:.5	
1	Dibromochloromethane	ND	ND	ND	ND	: . 5	
1	1.1.2-Trichloroethane	ND	ND	ND	ND	€.5	
1	cis-1,3-Dichloropropene	ND	ND	ND	ND	0.5	
	2-Chloroethylvinylether	ND	ND	ND	ND	i.5	
	Bromoform	ND	ND	ND	ND	0.5	
2	1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	1.5	
	Tetrachloroethene	ND	ND	ND	ND	3.5	
-	Chlorobenzene	ND	ND	ND	ND	3.5	
	Dichloropenzenes	ND	ND	ND	ND	ે.5	

Detection limit factor:	1.00	1.00	1.00	1.00
Surrogate Recovery %:	100	130	67	112
Analysis date:	12/11/86	12/12/86	12/19/86	12/12/86

^{1 -} these compounds coelute ND - not detected at detection limit times fastor 2 - these compounds coelute a - below normal laboratory background levels

^{3 -} mixture of isomers and coelute

^{4 -} these compounds coelute

Table 2. Analysis Type: 601 QA (continued)

	Sample Type: Sample ID#:	000613	DET 999999
	Compound	Concentra	tion ug/L
	Chloromethane	ND	0.5
	Bromomethane	ND	0.5
4	Dichlorodifluoromethane	ND	0.5
4	Vinyl Chloride	ND	0.5
	Chloroethane	ND	0.5
	Methylene Chloride	1.9 a	0.5
	Trichlorofluoromethane	ND	0.5
	1,1-Dichloroethene	ND	0.5
	1,1-Dichloroethane	ND	0.5
	trans-1,2-Dichloroethene	ND	0.5
	Chloroform	ND	0.5
	1,2-Dichloroethane	ND	0.5
	1,1,1-Trichloroethane	ND	0.5
	Carbon Tetrachloride	ND	0.5
	Bromodichloromethane	ND	0.5
	1,2-Dichloropropane	ND	0.5
	trans-1,3-Dichloropropene	ND	0.5
	Trichloroethene	ND	0.5
1	Dibromochloromethane	ND	0.5
1	1,1,2-Trichloroethane	ND	0.5
1	cis-1,3-Dichloropropene	ND	0.5
	2-Chloroethylvinylether	ND	0.5
	Bromoform	ND	0.5
2	1,1,2,2-Tetrachloroethane	ND	0.5
2	Tetrachloroethene	ND	0.5
	Chlorobenzene	ND	0.5
3	Dichlorobenzenes	ND	0.5

Detection limit factor: 1.00

97 Surrogate Recovery %:

Analysis date: 12/12/86

1 - these compounds coelute ND - not detected at detection limit times faithful 2 - these compounds coelute a - below normal laboratory background levels

3 - mixture of isomers and coelute

4 - these compounds coelute



AeroVironment 825 Myrtle Avenue Monrovia, Ca 91016 December 19, 1986 Acurex ID#: 8612-019 File 60112194

Attention: Chris Lovdahl

Subject: Analysis of Fourteen Water Samples

for Volatile Halogenated Organics, Received 12/11/86

Fourteen water samples were analyzed for volatile halogenated organics according to EPA Method 601 (Federal Register, Volume 49 #209, October 26, 1982; page 29). Results are presented in Table 1. Quality assurance data is presented in Table 2. The method can be summarized as follows:

Helium is bubbled through a volume of water contained in a specially designed purging chamber at ambient temperature. The purgable halogenated organic compounds are efficiently transferred from the aqueous phase to the vapor phase. The vapor is swept through a sorbent column where the purgeables are trapped. After purging is completed, the sorbent column heated and back flushed with helium to desorb the purgeables onto a gas chromatographic column. The gas chromatograph is temperature programmed to separate the purgeable which are then detected with a Hall detector run in series with a photoionization detector. SP-1000 on Carbopak B is used for the primary analysis. Confirmations are run using a Hall detector alone and a column containing n-octane on Porasil C.

If you should have any questions, please do not hesitate to call.

Submitted by: Such School

Sarah Schoen, Ph.D.

Staff Chemist

Grea Nicoll
Project Chemist

These results were obtained by following standard laboratory procedures; the liability of Acurex Corporation shall not exceed the amount paid for this report. In no event shall Acurex be liable for special or consequential damages.

Table 1. Analysis Type: 601 Results

	Sample Type: Sample ID#:	LAN 000615	LAN 000616	LAN 000617	LAN 000613	367 999933
	Sample ID#:					
	Compound		Concer	ntration ug/	L	
	Chlorometnane	ND	ND	ND	ND	
	Bromomethane	N D	ND	ND	ND	, Ξ
4	Dichlorodifluoromethane	ND	ND	ND	ND	<del>.</del>
1	Vinyl Chloride	ND	ND	ND	GN	, 5
	Shloroethane	ND	ND	ND	ND	:, €
	Methylene Chloride	1.7 a	N D	0.5 a	ND	3. €
	Trichlorofluoromethane	ND	ND	ND	ND	-
	1.1-Dichloroethene	ND	ND	ND	DM	, Ξ
	1.1-Dichloroethane	ND	ND	ND	ND	}. €
	trans-1,2-Dichloroethene	ND	ND	ND	ND	5.5
	Chloroform	ND	ND	ND	ND	}. ∄
	1,2-Dichloroethane	ND	ND	ND	ND	. <del>.</del> .
	1,1,1-Trichloroethane	ND	ND	ND	ND	:.5
	Carbon Tetrachloride	ND	ND	ND	ND	· •
	Bromodichloromethane	ND	ND	ND	ND	٠. ٦
	1,2-Dichloropropane	ND	ND	ND	ND	. :
	trans-1.3-Dichloropropene	ND	ND	ND	ND	, ₹
	Trichloroethene	ND	ND	ND	NΘ	1, ≣
1	Dibromochloromethane	ND	ND	ND	ND	. 5
1	1,1,2-Trichloroethane	ND	ND	ND	NB	=
1	cis-1.3-Dichloropropene	ND	ND	ND	ND	=
	2-Chloroethylvinylether	ND	ND	ND	C M	· Ξ
	Bromoform	ND	ND	ND	ND	. =
2	1,1,2,2-Tetrachloroethane	ND	ND	მ.გ თ	ND	ç.
2	Tetrachloroethene	ND	ND	0.6	ND	:.Ξ
	Chlorobeniene	ND	ND	МÐ	םמ	` , <del>-</del>
3	Dichlorobenzenes	ND	ND	ND	ND	.5

Detection limit factor:	1.00	1.00	1.00	1.00
Surrogate Recovery %:	114	96	93	112
Analysis date:	12/12/86	12/12/86	12/12/86	12/12/86

^{1 -} these compounds coelute ND - not detected at detection limit times faithful a - below normal laboratory background levels

^{3 -} mixture of isomers and coelute

^{4 -} these compounds coelute - n - not found in confirmation run

Table 1. Analysis Type: 601 Results ·continued)

Sample Type: Sample ID#:	LAN 000619	LAN 000620	EAN 000621	LAN 000622	0E+
Compound		Conce	ntration ug.	/L	
Chloromethane	ND	ND	ND	NC.	
Bromomethane	ND	ND	ND	ND.	· . =
4 Dichlorodifluoromethane	ND	ND	ND	ND	7. <u>E</u>
4 Vinyl Chloride	ND	ND	ND	ND	1.5
Chloroethane	ND	ND	ND	ND	. ₹
Methylene Chloride	ND	ND	ND	ND	2.5
Trichlorofluoromethane	ND	ND	ND	םוי	9.5
1,1-Dichloroethene	ND	ND	ND	ND	
1,1-Dichloroethane	ND	ND	ND	ND	9,5
trans-1,2-Dichloroethene	ND	ND	ND	ND	€. ₹
Chloroform	ND	ND	ND	ND	1.5
1.2-Bichlorsethane	ND	ND	ND	ND	0.5
1,1,1-Trichloroethane	ND	ND	ND	םא	ტ.ნ
Carbon Tetrachloride	ND	ND	ND	ND	3.5
Bromod:chloromethane	מא	ND	ND	ND	
1.2-Dichloropropane	ND	ND	ND	ND	. =
trans-1,3-Dichloropropene	ND	ND	ND	NB	1. I
Trichloroethene	ND	ND	ND	NE	1.€
1 Dibromochloromethane	ND	ND	NÐ	ND	5
1 1,1,2-Trichlorgethane	ND	ND	ND	ND	1. €
1 dis-1,3-Dichloropropene	ND	ND	ND	NE	. 5
2-Chloroethvivinylether	ND	ND	ND	ND	1.1
Bramafarm	ND	ND	ND	ND	, =
2 1.1.2.2-Tetrachloroethane	ND	ND	ND	ND	>.€
2 Tetrachloroethene	ND	ND	ND	ND	:. €
Chlorobenzene	ND	ND	ND	ND	₹.5
7 Dichlorobenzenes	ND	ND	ND	ND	). Ī

Analysis date:	12/12/86	12/12/86	12/12/86	12/12/86
Surrogate Recovery %:	107	101	130	80
Detection limit factor:	1.00	1.00	1.00	1.00

^{1 -} these compounds coelute ND - not detected at detection limit times recompounds coelute a - below normal laboratory background levels

^{3 -} mixture of isomers and coelute

^{4 -} these compounds coelute

Table 1. Analysis Type: 601 Results (continued)

	Sample Type: Sample ID#:	000623	LAN 000624	LAN 000625	LAN 900625	387 qqqqq
	Compound		Conce	ntration ug/	· L	
	Chloromethane	ND	ND	ND	NO	
	Bromomethane	ND	ND	ND	ND	. :
4	Dichlorodifluoromethane	ND	ND	ND	ND	. =
4	Vinvl Chloride	ND	GM	ND	ND	0.5
	Chloroethane	ND	ND	ND	ND	5
	Methylene Chloride	ND	ND	ND	ND	€.5
	Trichiorofluoromethane	מא	ND	ND	٩D	1.5
	1.1-Dichioroethene	ND	ND	ND	ND	. 5
	1.1-Dichloroethane	ND	ND	ND	ND	∴.5
	trans-1,2-Dichioroethene	ND	ND	ND	ND	5
	Chioroform	0.7	ND	ND	ND	. 5
	1.2-Dichloroethane	ND	ND	ND	ND	0.5
	1.1.1-Trichloroethane	ND	ND	ND	ND	ે. દ
	Carbon Tetrachloride	ND	ND	ND	ND	
	Bromodichloromethane	ND	ИD	ND	ND	. 5
	1.2-Dichloropropane	ND	ND	ND	ND	
	trans-1,3-Dichloropropene	ND	ND	ND	ND	. 5
	Trichloroethene	ND	ND	ND	NE	
1	Dibromochloromethane	ND	ND	ND	ND	. ₹
	1.1.2-Trichloroethane	ND	ND	ND	NE	:.5
	cis-1,3-Dichloropropene	ND	ND	ND	ND	
Ī	2-Chlorcethylvinylether	ND	ND	ND	ND	). <u>5</u>
	Bromoform	ND	ND	ON	ND	₹. <b>5</b>
2	1.1.2.2-Tetrachloroethane	ND	ND	ND	ND	;. €
=	Tetrachlorsethene	ND	ND	ND	ND	.5
-	Chlorobenzene	ND	ND	ND	ND	. ፤
:	Dichlorobenzenes	ND	ND	ND	ND	1.5

Detection limit factor:	1.00	1.00	1.00	1.00
Surrogate Recovery %:	108	82	78	85
Analysis date:	12/12/86	12/12/86	12/13/86	12/13/86

^{1 -} these compounds coelute ND - not detected at detection limit times factor 2 - these compounds coelute a - below normal laboratory background levels

^{3 -} mixture of isomers and coelute

^{4 -} these compounds coelute

Table 1. Analysis Type: 601 Pesults (continued)

	Sample Type: Sample ID#:	LAN 000527	LAN 000628	DET	
	Campaund	Concentration ug/L			
	Chloromethane	מא	ND	9.5	
	Bromomethane	ND	ND	0.5	
4	Dichlorodifluoromethane	מא	ND	0.5	
4	Vinyl Chloride	ND	ND	0.5	
	Chloroethane	ND	ND	்.5	
	Methylene Chiaride	ND	ND	0.5	
	Trichlorofluoromethane	סא	ND	0.5	
	1,1-Dichloroethene	ND	NÐ	0.5	
	1,1-Dichloroethane	ND	NB	3.5	
	trans-1,2-Dichloroethene	ND	ND	0.5	
	Chloroform	ND	ND	9.5	
	1,2-Dichloroethane	ND	2.8	0.5	
	1.1.1-Trichloroethane	ND	ND	9.5	
	Carbon Tetrachloride	ND	ND	0.5	
	Bromodichioromethane	ND	ND	0.5	
	1,2-Dichloropropane	ND	ND	9.5	
	trans-1,3-0:chloropropene	ND	NЭ	3.5	
	Trichloroethene	ND	ND	).5	
1	Dibromochloromethane	ND	ND	). <b>5</b>	
:	1,1,2-Trichloroetmane	ND	ND	Ů.5	
1	cis-1, I-Dichloropropene	ND	ND	0.5	
	2-Chloroethylvinylether	ND	ND	0.5	
	Bromoform	ND	ND	0.5	
2	1.1.2.2-Tetrachloroethane	ND	ND	0.5	
2	Tetrachloroethene	ND	ND	0.5	
	Chlorobenzane	ND	ND	0.5	
-	Dichlorobenzenes	ND	ND	0.5	

Detection limit factor: 1.00 1.00

Surrogate Recovery %: 71 147

Analysis date: 12/13/86 12/15/86

^{1 -} these compounds coelute ND - not detected at detection limit times is the

^{2 -} these compounds coelute

^{3 -} mixture of isomers and coelute

^{4 -} these compounds coelute

Table 2. Analysis Type: 601 2A

Sample Type: Sample IC#:	MB1 999998	MB2 99998	MB3 999998	581 99999	0E - sogess
Sampound		Concen	tration ug/l	•	
Unloromethane	ND	ND	ND	ND	, 7
Scompachane	ND	ND	ND	M5	. =
4 Dichlorodifluoromethane	ИD	ND	ND	NB	. 5
4 Jinvl Chloride	ND	ND	ND	NE	. 5
Chicroethane	ПN	ND	ND	NE	🖺
Methylane Chloride	2.1 a	4.1 a	1.1 a	().7 a	, 5
Tricolorofluoromethane	ND	ND	ND	ND	0.5
1,1-3:znloroethene	ND	ND	ND	ND	. 5
1.1-Dichloroethane	ПN	ND	ND	ND	], ∃
trans-1,2-Bichloroethene	ND	ND	ND	٩D	5
Chloroform	ND	ND	ND	ND	1.5
1,2-Dichloroethane	ИD	ND	ND	ПD	3.5
1,1,1-Trichloroethane	ND	ND	ND	ПD	1.5
Caroon Tetrachloride	ND	ND	ND	ND	٠, ٦
Bromodicaloromethane	ND	ND	ND	٧D	7
1,2-Sichioropropane	ND	ND	ND	ND	=
trans-1.T-Dichloropropene	ND	ND	ND	ND	. ፤
Trichloroethene	ND	ND	NB	NB	
1 Dibromocoloromethane	ND	ND	CV	ND	•
1 1,1,2-Trichloroethane	ND	ND	ND	¥2	. Ξ
1 cis-1.J-Dichloropropene	ND	ND	ND	3.6	. 5
I-Chloroethylvinylether	ND	ND	ND	ND	
Bromutorm	ND	ND	ND	NΟ	′. <u> </u>
2 1,,2,2-Tetrachioroethane	ND	ND	ND	ND	. :
I Tetrachioroethene	ND	ND	ND	NE	. Ξ
Chlorobenzene	ND	ND	N D	CP	
I Dichlorobenzenes	ND	ND	ND	ND	· . =

Detection limit factor:	1.00	1.00	1.00	1.00
Surrogate Recovery %:	130	120	9:5	114
Analysis date:	12/12/86	12/15/86	12/17/86	12/12.86

^{1 -} these compounds coelute - ND - not detected at detection limit times factor 2 - these compounds coelute - a - below normal laboratory background levels - mixture of isomers and coelute

^{4 -} these compounds coelute

Table 2. Analysis Type: 601 QA continued:

Sample Tude: Sample ID#:	LDU 000 <b>617</b>	LDU 999523	LSP 000 <b>015</b>	MSL 200513	0E7 993333
Compound		Concer	itration ugr		
Chloromethage	ND	ND	74 :	13 =	
Bromomethane	ND	ND	77 %	10 s	, :
4 Dichlorodifluoromethane	ND	ND	78	1 9	+ + =
4 Vinvl Chloride	ND	ND	79 :	10 s	- -
Chioroethane	ND	ND	79 %	10 s	- -
Methylene Chloride	ND	ND	72 %	1. 3 5 g	=
Trichlorofluoromethane	ND	ND	90 %	5 5	
1.1-Disalorpethene	ND	ND	96 %	5 5	• -
1,1-Dichloroethane	ND	N D	89 4	- 3 - 5	
trans-1,2-Dichloroethene	ND	ND	91 %	5 s	, <del>.</del>
Chloriform	ND	ND	98 /	5 s	: •
1.2-Dichloroethane	2.2	1.2	78 %	5 5	7 =
1,1,1-Trichloroethane	N D	ND	91 %	5 5	, <del>, , ,</del>
Carbon Tetrachloride	ND	ND	91 %	5 3	. 5
Bromodishloromethane	ND	N D	go v	5 5	• =
1.1-Dichloropropane	ND	ND	90 %	5 3	- +
trans-1,J-Dichloropropene	ND	ND	ga y	5 5	· -
Trichloroethene	ND	ND	92 1		· ·
1 Bibromochloromethane	ND	ND	<b>9</b> 0 g	5 s	
1 1.1.2-Trichloroethane	ND	ND	90	5 g	
i cis-1.J-Dichloropropene	ND	ND	90	5 s	
I-Chicroethylvinylether	ND	ND	5 7	5 3	• •
Bromoform	ND	ND	92 V	<b>5</b> =	· ·
2 1.1.2.2-Tetrachloroethane	v. 9	ND	9 <b>9</b> %	5 5	-
2 Tetrachloroethene	0 <b>.9</b>	ND	94 7	5 =	
Chlorocenzene	ND	ND.	98 %	5 5	- -
3 Dichlorobenzenes	ND	ND	95 %	15 s	Ξ.

Detection limit factor:	1.00	1.00	1.00
Surrogate Recovery %:	105	84	94
Analysis date:	12/17/86	12/17/86	12/17/86

¹ — these compounds coelute - ND — not detected at detection limit times -article these compounds coelute

^{3 -} mixture of isomers and coelute

^{4 -} these compounds coelute



Hend/Importent BIB Muntle Avenue Munnovia, Ia Rivib Gesember 23. 1985 Adure (1841 85125 2) Fila 591122 4

Attention: Obris Lovdani

Subject: Analysis of Ten Water Samples for Volatile Halogenated Organics, Received 12/12/85

Ten water samples were analyzed for volatile halogenated organics according to EPA lethod 571. Federal Register, volume 49 #209, October 25, 1984; page 29. Results are presented in Table 1. Quality assurance data is presented in Table 2. The method can be summarized as follows:

melium is pubbled through a volume of water contained in a speciall, designed purging chamber at ambient temperature. The purgable halogenated organic compounds are efficiently transferred from the aqueous phase to the vapor phase. The vapor is swept through a sorbent column where the purgeables are trapped. After purging is completed, the sorbent column teated and back flushed with helium to desorb the purgeables onto a gas chromatographic column. The gas chromatograph is temperature programmed to separate the purgeable which are then detected with a Hall betector run in series with a photoconization detector. SP-1000 on Carbopak B is used for the primary analysis. Confirmations are run using a Hall detector alone and a column containing n-octane on Porasil D.

If you should have any questions, please do not hesitate to call.

Submitted by:

Sarah Schoen, Ph.D. Staff Chemist Greg Nizoli Project Chemist

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These results were obtained by following standard laboratory procedures: the liability of Acurex Corporation shall not exceed the amount paid for this report. In no event shall Acurex be liable for special or consequential damages.

Table 1. Analysis Type: 601 Results

Sample T.oe:	LAN	LAN	LAN	LAN	2£7
Sample ID#:	000629	000 <b>5</b> 30	000631	Jyvelu	
Johnound		Sance	ntration ug	-	
Onloromethane	ND	ND	ND	`_	, Ξ
Bromomethane	GM	ND	ND	¥0	Ę
4 Dichlorogiflugromethane	ND	ND	ND	72	. 7
4 Vinyl Chloride	ND	ND	Cr	90	, 5
Chloroethane	ND	ND	ND	N.D	υĒ
Methylene Enlaride	ND	ND	ND	ND	. :
Trichlorofluoromethane	ND	ND	ND	NE	. 5
1.1-Dichloroethene	ND	ND	ND	40	. 5
1.1-Dichlorpethane	ND	ND	ND	ND	1,5
trans-1,2-Dichloroethene	ND	ND	ND	ND	. 5
Chloroform	ND	ND	ND	ND	1.5
1.2-Dichloroethane	ND	ND	ND	ΝÐ	. Ξ
1,1,1-Trichlorgethane	ПD	ND	ND	ND	, Ξ
Carbon Tetrachloride	ND	ND	ND	ND	. 🖫
Bromodichloromethana	ND	ND	ND	ΝÜ	. :
1,2-Bichloropropane	ND	ND	ND	CN	7 -
trans-1,3-Bichloropropene	DN	ND	ND	NE:	, <u>=</u>
Trichloroethene	ND	ND	7.8	17.3	٠. ق
1 Dibromochloromethane	ND	ND	ND	ND	=
1 1,1,2-Trichloroethane	ND	ND	GM	ND	3
1 cis-1,3-Dicaloropropene	ND	ND	ND	ND	
2-Chloroethylvinylether	DN	ND	CM	45	, =
Bromoform	ND	ND	ND	ND	
2 1.1.2.2-Tetrachloroethane	ND	ND	1.0 n	2.7 -	. Ξ
2 Tetrachloroethene	ND	ND	1.0	2, 7	. ŧ
Chloropenzene	ND	ND	ND	ND	. Ξ
7 Dichlorobenzenes	ND	ND	ND	ND	= -

Detection limit factor:	1.00	1.00	1.00	1.00
Surrogate Recovery %:	107	82	99	74
Analysis date:	12/15/86	12/17/86	12/22/86	12/22/86

^{1 -} these compounds coelute - ND - not detected at detection limit times reliand these compounds coelute - a - below normal laboratory background levels - mixture of isomers and coelute

n - not found in confirmation run 4 - these compounds coelute

Table 1. Analysis Type: 601 Results (continued)

	Sample Type: Sample ID#:	000 <b>9</b> 22 Fan	000634	LAN 000635	000636	DET 299099
	Compound		Concer	itration ug/L	,	
	Chloromethane	ND	ND	ND	ND	). E
	Bromomethane	ND	ND	ND	ND	. 5
4	Dichlorodifluoromethane	ND	1.0 n	ND	ND	),5
	Vinvl Chloride	ND	1.0	ND	ND	5
	Chloroethane	ND	ND	ND	פא	. 5
	Methylene Chloride	ND	ND	ND	0.9 a	0.5
	Trichlorofluoromethane	ND	ND	ND	ND	ે.5
	1.1-Dichloroethene	ND	ND	N D	ND	) <b>.</b> 5
	1.1-Dichloroethane	ND	ND	ND	ND	· 5
	trans-1,2-Dichloroethene	ND	1.1 n	ND	ND	5
	Chloroform	ND	ND	0.9 n	4.8	0.5
	1,2-Dichloroethane	ND	ND	ND	ND	♦.5
	1,1,1-Trichloroethane	ND	ND	ND	ે. 8	0.5
	Carbon Tetrachloride	ND	ND	ND	٧D	1,5
	Bromodichloromethane	ND	ND	ND	ND	. =
	1,2-Dichloropropane	ND	ND	ND	ND	0.5
	trans-1,3-Dichloropropene	מא	ND	ND	ND	5
	Trichloroethene	ND	7.0	ND	ND	· <u>-</u>
1	Dibromochloromethane	ND	ND	ND	ND	•.5
1	1.1.2-Trichloroethane	ND	ND	ND	ND	۲.5
1	cis-1,J-Dichloropropene	ND	ND	ND	ND	).5
	2-Shloroethylvinylether	ND	ND	ND	ND	,, €
	Bromoform	ND	ND	ND	ND	).5
2	1.1.2.2-Tetrachloroethane	ND	0.6 n	ND	ND	1.5
2	Tetrachloroethene	ND	0.6	ND	ND	∵.5
	Chlorobenzene	ND	ND	ND	ND	3.5
3	Dichlorobenzenes	ND	ND	ND	ND	. 5

Detection limit factor:	1.00	1.00	1.00	1.00
Surrogate Recovery %:	98	99	102	87
Analysis date:	12/22/86	12/22/86	12/22/86	12/22/86

ND - not detected at detection limit times factor a - below normal laboratory background levels 1 - these compounds coelute

^{2 -} these compounds coelute

^{3 -} mixture of isomers and coelute

n - not found in confirmation run 4 - these compounds coelute

Table 1. Analysis Type: 501 Results continues:

Bamole Type:	_ <del>-</del> i N	±AN	DET
Sample ID#:	000617	0.00518	333303
Compound	Jane	entration uq	)/ ₄
Chloromethane	ND	NB	0.5
Bromometrane	ND	ND	0.5
Dichlorodifluoromethane	ND	ND	ં. 5
- Vinvl Chloride	ND	ND	0.5
Chloroethane	ND	ND	9.5
Methylene Chloride	ND	ND	0.5
Trichlorofluoromethane	ND	ND	⊹.5
1.1-Dichlorpethene	ND	ND	÷.5
1.1-Dichloroethane	ND	ND	0.5
trans-1.2-Dichloroethere	e ND	ND	2.5
Chiproform	ND	ND	்.5
1.2-Dichloroethane	ND	ND	0.5
1,1,1-Trichlorgethane	ND	⊕์.∋า	0.5
Carbon Tetrachloride	ND	ND	9.5
Bromodishloromethane	ND	В	3.5
1.2-Dichloropropane	N D	ND	ij. <u></u>
trans-1.0-Dichloroproper	ne ND	ND	. 5
Trichlorcethene	ND	ND	0.5
Dipromochioromethane	ND	ND	ે.5
1.1.2-Trichloroethane	ND	ND	0.5
cis-1.I-Dichloropropene	ND	סא	3.5
1-Chloroethyl/invlether	ND	ND	0.5
Bromoform	ND	ND	ે.5
1.1.2.2-Tetrachloroetham	ne ND	ND	0.5
Tetrachloroethene	ND	ND	0.5
Chlorobenzene	פא	ND	Ů. <b>S</b>
Dichlorobenzenes	NB	ND	).5

Detection limit factor: 1.00 1.00 Surrogate Recovery %: 75 95

Analysis date:

12/22/86 12/16/86

^{1 -} these compounds coelute ND - not detected at detection limit times matrix 2 - these compounds coelute a - below normal laboratory background levels

^{3 -} mixture of isomers and coelute

^{4 -} these compounds coelute in - not found in confirmation run

Table 1. Analysis Type: 501 0A

	Bample Tupe: Bample ID#:	MB1	48 <u>7</u> \$90009	MB7 909099	MB4 000000	757
	lompound		lonser	itration ug l	•	
	Inlorgmethane	NO	ND	NO	7,2	
	Promomethane	ND	ND	ND	NO	
:	Dichlorodifluoromethane	NO	40	ND	V2	₹
:	vin.1 Chloride	ND	ND	GM	<b>4</b> D	
	Intorpethane	ND	NB	ND	N2	₹
	Methilere Inloride	NЭ	1.1 a	:.5 a	2.3 ∌	-
	Tristionofluoromethane	ND	ND.	ND	ND	=
	1,1-Displanaetheme	ND	NO.	NB	75	Ŧ
	1,1-Dichloroethane	<b>ND</b>	ND	ND	VC.	Ŧ
	trans-1,2-Bichlordethene	NO	ND	ND	NO	7
	Shlaroform	NO	NO	ND	ND	₹.
	1.2-3:chloroethane	ND	ND	NO.	CV	=
	1.1.1-Triphloroethane	ND	ND	ND	NB	· · · · · · · · · · · · · · · · · · ·
	Darbon Tetrachloride	ND	ND	ND	CP	=
	Eromodichloromethane	ND	ND	NO	NI.	Ŧ.
	1,2-3:chloropropane	ND	ND	NÐ	NB	<u> </u>
	trans-1,J-0:chloropropene	ND	ND	N D	N2	į.
	Trishloroethene	ND	ND	ND	NO	: -
:	Dibramachlaromethane	ND	ND	МÐ	ND	. 5
	1,1.3-Trichloroethane	ND	ND	ND	N2	Ę
:	ors-i,I-Bichloropropene	ND	ND	ND	NE	₹
	2-Onlorgethylvinylether	ND	٧D	ND	NB	=
	Bromotorm	ND	ND	ND	NE	·
2	1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	7
2	Tetrachioroethene	ND	ND	ND	NO	*
	Shloropensene	ND	ND	CM	ЧD	-
-	Sichlorodenzenes	ND	ND	ND	ND	. Ī

Detection limit factor:	1.00	1.00	1.00	1.00
Surrogate Recovery %:	130	90	79	97
ûnalvete date:	17/15/24	12/17/84	12/18/84	12/22 95

^{1 -} these compounds coelute  $\sim$  ND - not detected at detection limit times faithful these compounds coelute  $\sim$  a - below normal laboratory background levels  $\mathbb T$  - mixture of isomers and coelute

^{4 -} these compounds coelute

Table I. Analysis Type: 511 CA continued:

	Bample Topa: Bample IC≰:	38: 38:	500 000 <b>5</b> 00	15P	MG_ 191527	
•	Iompound		Cancer	itration _g	_	
	Dhìoromathana	۷ <u>۵</u>	ND	88 '.	; ;	
	Bromomethate	ND	ND	87 7	1 =	7
	Disploradifluoromethase	ND	٧Ď	a- «	1 1	-
	Vinvi Enloride	ND	٧D	88 %	1 1	-
	Inlanaethane	NB	٧D	88 1		-
	Methylene Chloride	ND	9.7 a	3: :	5 3	
	Trisplorofluoromethane	N D	GV	71 1	5 5	Ę
	1,1-Dichloroethene	ND	ND	35	5 3	, <del>,</del>
	1.1-Dismiorpethane	ND	ND	87 %	= =	
	trans-1.I-Dichlordethene	NB	ND	၁၇ %	5 3	
	Thisraform	ND	ND	₹5 1	5 a	
	1.2-Bichlordethane	ND	ND	4	5 5	-
	1,1,1-Trichloroethane	พื้อ	٩	₹5 %	5 1	
	Tarbon Tetrachloride	ND	ND	94 %	5 1	
	Brompdichloromethane	ND	ND.	91	· · · · · · · · · · · · · · · · · · ·	
	1.2-Dichloropropane	NO.	ND	<b>4</b> 4	· · · · · · · · · · · · · · · · · · ·	-
	trans-1.I-Dichloropropene	ND	ND	वत्र 🤄	5 1	
	Trichlorgethene	ND	ND	≎4 .	· ·	-
	Sipromochloromethane	ND	NE.	89 4		-
	1.1.2-Trichlorcethane	N D	ND	85		
	is-1.3-0:chloropropene	ND.	N D	39 %	5 s	
	I-Inlorseth/l/invlether	ND	ND	-5 :	3 8	=
	Branatara	ND.	GN	92 %	 	-
- '	1.1.1.2-Tetrachioroethane	ND	ND.	75 %	5 5	-
-	Tatrachiorpethene	ND	ND	75 %		
	Thistopencene	ND	<b>7</b> 0	100 %		_
	Dichloropenienes	ND	ND	75		

Detection limit factor:	1.00	1.00	1.00	1.00
Surrogate Recovery %:	90	97	95	)
Analysis date:	12/15/86	12/18/86	12/17/86	12/17 85

^{7 -} mixture of isomers and coelute should spiked in sample

^{4 -} these compounds coefute - % - percent recovery from spiked sample



Perovicinant POS Myrtle Avenue Monrovia, Da 91016 December 29, 1985 Acures 10#: 8612-022 File 6011222A

Attention: Chris Lovdahl

Subject: Analysis of Ten Water Samples for Volatile Halogenated Organics, Received 12/17/86

Ten water samples were analyzed for volatile halogenated organics according to EFA Method 601 (Federal Register, Volume 49 #209, October 26, 1984; page 29). Results are presented in Table 1. Quality assurance data is presented in Table 2. The method can be summarized as follows:

Helium is bubbled through a volume of water contained in a specially designed ourging chamber at ambient temperature. The purgable halogenated organic compounds are efficiently transferred from the aqueous phase to the vapor phase. The vapor is swept through a sorbent column where the purgeables are trapped. After purging is completed, the sorbent column heated and back flushed with helium to desorb the purgeables onto a gas chromatographic column. The gas chromatograph is temperature programmed to separate the purgeable which are then detected with a Hall detector run in series with a photoionization detector. S2-1000 on Carbopak B is used for the primary analysis. Confirmations are run using a Hall detector alone and a column containing n-octane on Porasil C.

If you should have any questions, please do not hesitate to call.

Submitted by:

Sarah Schoen, Ph.D.

Staif Chemist

Greg Nycoll

Project Chemist

These results were obtained by following standard laboratory procedures: the liability of Acurex Corporation shall not exceed the amount paid for this report. In no event shall Acurex be liable for special or consequential damages.

Table 1. Analysis Type: 501 Results

Sample T.se: Sample ID#:	_AN 000639	EAN 000540	LAN 000641	14N 000541	:5* : <b>;:</b> :::
Iompound		Conce	ntration ug	· L	
Chloromethane	NC	מא	ND	\D	7
Bromomethane	ND	ND	ND	٠ <u>٠</u> و٧	-
4 Dichlarosifluorometrane	ND	ND	ND	ND	₹
4 Jinvi Chloride	ND	ND	ND	ΝE	. :
Chiorpethane	NÐ	ND	ND	ND	•
Methylene Chloride	ND	ND	ND	ND	. =
Thichlorofluoromethane	ND	ND	ND	ND	: . =
1,1-Distiorpethene	ND	ND	ND	ND	=
1.1-Dichloroethane	ND	ND	ND	ND	:. <del>.</del>
trans-1,2-Dichloroethene	ND	ND	ND	ND	. €
Shlaraform	ND	ND	ND	ND	€.5
1,2-Bichlorsethane	ND	ND	ND	45	. ፤
i.i.i-Trichloroethame	ND	ND	ND	ND	• •
Carbon Tetrachloride	ND	ND	ND	NO	• =
Bromod:chloromethane	3.0	В	ND	NO	• , 7
1,2-Bichloropropane	ND	ND	שמ	N۵	:
trans-1,I-Dichloropropene	ND	ND	ND	NE	. 🗄
Trichloroethene	ND	CV	ND	NI.	. ፤
1 Dipromochloromethane	٩D	ND	ND	NB	₹.
1 1.1.2-Trichloroethane	QV	ND	ND	ΝΞ	Ξ
i dishi,I-Bichloropropene	ND	ND	ND	3 <i>V</i>	· . I
1-1hloroethylvinylether	ND	ND	ND	CP	. 5
Bromoform	ND	ND	ND	ND	· , •
2 1,1,2,2-Tetrachloroethane	ND	ND	ND	40	. 🗓
1 Tetrachicroethene	ND	ND	D	ND	Ŧ.
Chlorobenzene	ND	םא	ND	NO	. Ī
J Dichlorobenzenes	ND	ND	ND	NO	₹.

Detection limit factor:	1.00	1.00	1.00	1.00
Surrogate Recovery %:	110	72	67	58
Analysis date:	12/18/86	12/18/96	12/18/86	12/18/86

^{1 -} these compounds coelute  $\sim$  ND - not detected at detection limit times fairly 2 - these compounds coelute  $\sim$  a - below normal laboratory background levels 3 - mixture of isomers and coelute

ı

^{4 -} these compounds coelute

Table 1. Analysis Type: 501 Results -continues:

Sample T.de: Sample ID#:	EAN 000643	EAN 000544	£AN 000645	LAN 010545	257
Compound		Sancer	ntration ug.		
Enloromethane	ON	ND	n D	72	
Bromomethane	ND	ND	ND	ND	=======================================
4 Dichlorodifluoromethane	ND	ND	ND	<b>\.</b> 5	± :
4 vinvl Chloride	ND	ND	ND	NE	=
Chloroethane	ND	ND	ND	٧D	. =
Methylene Chloride	ND	ND	ND	ND	
Trichlorofluoromethane	ND	ND	ND	ND	. :
1.1-Dichloroethers	ND	ND	ND	ND	1.5
1.1-Dichlorgethane	ND	۵۲	ND	ND	. =
trans-1.2-Dichloroethene	ND	ND	ND	ND	- <del>-</del> -
Chloroform	ND	٧D	ND	.⁴ D	1.5
1.2-Dichloroethane	ND	ND	ND	МÐ	· , =
1.1.1-Trichlorgethane	ND	ND	DN	מא	. Ξ
Carbon Tetrachloride	ND	ND	ND	NO	
Bromodichloromethane	DN	N D	СИ	n D	ŧ
1,2-Dichleropropane	ND	UD	ND	NE	. =
trans-1.3-Dichloropropene	ND	ND	ND	ND	. 7
Trichloroethene	ND	5.7	ND	<b>45</b>	. =
1 Dibromochloromethane	GN	ND	ND	N⊃	. 5
1 1,1,2-Trichloroethane	ND	ND	ND	VO.	, 7
i dis-1.T-Dichloroprocene	ND	סני	ND	NO	. 5
1-Shloroethvlvinviether	ND	ND	ND	<b>N</b> B	, 5
Bromo÷orm	N D	ND	ND	MD.	•
2 1.1.2.2-Tetrachioroethane	ND	ND	NB	ND	υĒ
2 Tetracoloroethene	ND	ND	ND	NZ	
Shipropersere	ND	ND	ND	ND.	~
I Bichlorobenzenes	ND	ND	ND	ΝÎ	

Detection limit factor:	1.00	1.00	1.50	1.00
Surrogate Recovery %:	49	73	55	192
Analysis date:	12/19/86	12/22/86	12/22/86	12/19/86

^{1 -} these compounds coelute - ND - not detected at detection limit times for 2 - these compounds coelute - a - below normal laboratory background level 7 - mixture of isomers and coelute

^{4 -} these compounds coelute

Table 1. Analysis Type: 601 Results (continued)

	Sample Type: Sample ID#:	LAN 000647	LAN 000648	DET 999999
	Compound	Conce	entration	ug/L
	Chloromethane	ND	ND	ં.5
	Bromomethane	ND	ND	0.5
4	Dichlorodifluoromethane	ND	ND	0.5
4	Vinyl Chloride	В	ND	0.5
	Chloroethane	ND	ND	0.5
	Methylene Chioride	ND	1.4	a 0.5
	Trichlorofluoromethane	NÐ	ND	0.5
	1,1-Dichloroethene	ND	ND	0.5
	1,1-Dichloroethane	ND	ND	0.5
	trans-1,2-Dichloroethene	ND	ND	0.5
	Chloroform	ND	ND	0.5
	1,2-Dichloroethane	ND	ND	0.5
	1,1,1-Trichloroethane	N D	ND	0.5
	Carbon Tetrachloride	ND	ND	0.5
	Bromodichloromethane	ND	0.7	0.5
	1,2-Dichloropropane	ND	ND	0.5
	trans-1,3-Dichloropropene	ND	ND	<b>0.5</b>
	Trichloroethène	1.8	ND	0.5
1	Dibromochloromethane	ND	1.7	0.5
1	1,1,2-Trichloroethane	ND	1.7	n 0.5
1	cis-1,3-Dichloropropene	ND	1.7	
	2-Chloroethylvinylether	ND	ND	0.5
	Bromoform	ND	2.0	0.5
2	1,1.2.2-Tetrachloroethane	ND	ND	0.5
	Tetrachloroethene	ND	ND	0.5
	Chlorobenzene	ND	ND	0.5
3	Dichlorobenzenes	ND	ND	0.5

Detection limit factor:	1.00	1.00
Surrogate Recovery %:	102	121
Analysis date:	12/19/86	12/23/86

^{1 -} these compounds coelute ND - not detected at detection limit times factor 2 - these compounds coelute a - below normal laboratory background levels

^{3 -} mixture of isomers and coelute

^{4 -} these compounds coelute n - not found in confirmation run

Table 1. Analysis Type: 501 CA

Bample Type:	MB1	M82	MB7	MB4	25
Sample ID#:	င်င်ငင်မှ	226623	900005	300003	352333
Compound		Concer	itration ugʻ	<u>-</u>	
2	ND	NC	NB	NB	=
Chloromethane	ND ND	D G N	ND	ND ND	7
Eromomethane	ND ND	ND ND	ND ND	7.5	=
4 Dichlorogifluoromethane	· <del>-</del>	7.D N.D	ND	ND	<del></del>
4 vinyl Chloride	ND	· <del>-</del>	-	ND ND	, =
Chloroethane	N D	ND NB	ND 10-	_	
Methylene Shloride	1.6 a	ND NO	2.9 a	ND	· · · · · · · · · · · · · · · · · · ·
Trichlorofluoromethane	ND	ND	ND	ND	• :
1.1-Dichloroethene	ND	ND	ND	ND	• =
1,1-Sichloroethane	NS	ND	ND	ND	_
trans-1,2-Dichloroethene	ND	ND	ND	ND	
Chlaroform	ND	ND	ND	ND	. • -
1,2-Bichloroethane	ND	CN	ND	מא	. 1
1.1.1-Trichloroethane	N.D.	ND	ND	ND	1.5
Carbon Tetrachloride	ND	ND	ND	ND	, 5
Bromodichloromethane	ND	ND	ND	ND	. 5
1,2-0ichloropropane	ND	ND	ND	ND	,
trans-1.I-Dichloropropens	e ND	ND	ND	ND	, -
Trichloroethene	ND	ND	ND	NB	. 5
1 Dibromochloromethane	ND	ND	ND	ND	1, 5
1 1.1.2-Trionloroethane	ND	ND	ND	ND	, <del>=</del>
1 dis-1.I-Dichloropropene	NО	ND	ND	ND	. 5
2-Shloroethvl/invlether	Q M	NĐ	ND	ND	. =
Bromoform	NE	ND	ND	ND	1.5
I 1,1,2,2-Tetrachloroethane	e ND	ND	ND	งอ	. 5
I Tatrachloroethene	ND	ND	NÐ	NE	}.∄
Chlorobenzene	ND	ND	ПD	NE	. 5
I Dichlorobenzenes	ND	ND	ND	ND	. Ī

Detection limit factor:	1.00	1.00	1.00	1.00
Surrogate Recovery %:	79	70	97	75
Analysis date:	12/18/86	12/19/86	12/22/86	12/23/86

^{1 -} these compounds coelute - ND - not detected at detection limit times factor 2 - these compounds coelute - a - below normal laboratory background levels 7 - mixture of isomers and coelute

^{4 -} these compounds coelute

Table I. Analysis Type: 5 1 14 tont:nued

Bample Tipe: Bample ID#:	551	_25 202548	_3F 10 =42	₩ <u>9</u> 10154I	0 E T 0 0 0 0 0 0
Domocuna		Conten	tration lg .	-	
Inlongmentage	ND		35 %	1 :	
Bromomethane	NE	ND	74	1 ' =	<del>-</del>
4 Distingsifiusesmethane	ND	מא		1 1	=
4 Vinvl Chloride	ND	ND	11.5 %	<u> </u>	-
This roethane	ND	ΝĎ	4.5	1 =	₹
Mathylene Inlamide	1.2 a	ND	14	5 €	. <del>.</del> .
Entablemofileromethane	ND	N D	₹8 %	<u> </u>	. <del>.</del>
1,1-Dichloroethere	ND	ND		5 3	
t.l-Dichlorgethane	ND	ND	1.00	5 s	
trans-1,2-Dichloroethene	ND	NO	95 %	5 9	. 5
Interaform	CM	ND	₹5 %	5 =	Ę
1,2-8:chloroethane	ND	ND	113 %	5 s	. 5
1,1,1-Trionlorgethane	ND	NB		<b>.</b>	. =
Carbon Tetrachionide	NI	ND	97 %	<b>.</b> .	Ŧ
Eranadiationamethane	NO		113.3	₹ :	. =
1,2-0:inlaropropane	NE	VΕ	\$ <b>.</b>	Ī :	=
trans-1,3-0:chloropropene	N 9	NO		Ī 3	Ŧ
Trieniere	٧S	ND		₹ ‡	₹
1 Dipromoshloromethane	ND	1.5	: : :	<b>:</b> :	-
1 1,1,2-Tripplorpethage	NO	1.=		Ţ ;	<del>.</del>
1 mis-1.T-Girnlaropropere	NE	:5		₹ :	ŧ.
I-Chicroethvivinviether	ND	N2	112 7	5 5	₹ -
Branaform	ND	1.3	123 %	5 s	-
2 1,1,2,2-Tetrachlorgethane	ND	NÊ	95 %	<b>5</b> 3	
I Tetractionostosne	ND	NĐ	95 %	5 =	₹.
Chlorodensene	NE	ND	110 1	5 =	
7 Diphloropenzenes	ND	ND	123 %	:5 s	. :

Detection limit factor:	1.00	1.00	1.00	1.60
Surrogate Resovery W:	3.7	<b>ə</b> <u>1</u>	112	
Analysis date:	12/23/86	12/23/96	12/27/86	12 20/86

^{1 -} these compounds coelute - ND - not detected at detection limit times compounds coelute - a - below normal laboratory background levels - T - mixture of isomers and coelute - s - amount spiked in sample

^{4 -} these compounds coelute ... - percent recovery from socied sample





Aerovironment 325 Myrtle Avenue Monrovia, Da 91015

December 39, 1986 Acure: 10#: 8612-733 File 5011227A

Attention: Enris Loudanl

Subject: Analysis of Thirteen Water Samples for Volatile Halogenated Organics, Received 12/15/36

Thirteen water samples were analyzed for volatile halogenated organics according to EPA Method 501 Federal Register, Volume 49 #209, October 26, 1984; page 19). Results are presented in Table 1. Quality assurance data is presented in Table 2. The method can be summarized as follows:

> Helium is pubbled through a volume of water contained in a specially designed purging chamber at ambient temperature. The purgable halogenated organic compounds are efficiently transferred from the aqueous phase to the vapor phase. The vapor is swept through a sorbent column where the purgeables are trapped. After purging is completed, the sorbent column heated and back flushed with helium to desorb the purgeables onto a gas chromatographic column. The gas chromatograph is temperature programmed to separate the purgeable which are then detected with a Hall detector run in series with a photosonization detector. SP-1000 on Carbopak B is used for the primary analysis. Confirmations are run using a Hall detector alone and a column containing n-octane on Porasil C.

If you should have any questions, please do not hesitate to call.

Submitted by:

Sarah Schoen, Ph.D.

Staff Chemist

Greg Micoll

Project Chemist

These results were obtained by following standard laboratory procedures: the liability of Acurex Corporation shall not exceed the amount paid for this report. In no event shall Acure: be liable for special or consequential damages.

Table 1. Analysis Type: 501 Results

Sample Type: Sample ID#:	EAN 994549	_AN 000±50	LAN 200651	_AN 000552	157 :::::::
Compound		Cancen	tration ug :	-	
Chloromethane	ND	าก กก	ND	V2:	
Bromomethane	٧D	N D	٧D	N.E	-
4 Dichlorodifluoromethane	ND	N D	NO.	NE.	· ·
4 Vinvl Chloride	٩D	N D	ND	NO.	- 1
Chloroethane	ND	ND	ND	NO.	· -
Methylane Chloride	ND	1. 3 a	1.0 a	. 2 a	-
Trichlorofluoromethane	ND	ND	พอ	ND	• =
1,1-Dichloroethene	ND	CN	NO	VC	
1.1-Dichloroetmane	ИD	NO	ND	ND	· · · · · · · · · · · · · · · · · · ·
trans-1,2-Bichloroethene	ND	ND	ND	N5	
Shloroform	NB	ND	NE	N D	· · · · · · · · · · · · · · · · · · ·
1,2-DichloroetHane	ND	ND	ND	NO	
1.1.1-Trichloroethane	ND	ND	NE	ND	
Carbon Tetrachloride	N D	ND	ND.	ΝĒ	<del>-</del>
Bromodichloromethane	ND	ND	ND	NΩ	•
1,2-Dichloropropane	ND	ND	ND	45	. =
trans-1.3-Dichloropropene	ND	ND	ND	ΝĎ	. Ξ
Trichloroethene	ND	NO	N D	NÖ	. 5
1 Dibromochloromethane	ND	ND	ND	ND:	. 7
1 1,1,2-Trichloroethane	N D	ND	CV	•.0	Ē
1 dis-1.J-Dichloropropene	ND	ND	ND	ND	, =
1-Chloroethylvinylether	ND	ND	ND	NO	. 1
Eromotorm	ND	ND	ND	ND	. =
2 1,1,2,2-Tetrachloroethane	ND	ND	ND	NO	, <del>T</del>
2 Tetrachloroethene	ND	ND	ND	NO	. =
Chlorobenzene	ND	ND	ND	NO	÷
3 Bichloropenzenes	ND	ND	ND	NE	. Ξ

Detection limit factor:	1.00	1.00	1.00	1.17
Surrogate Recovery %:	101	106	95	<del></del>
Analysis data:	12/19/84	17/19/86	17/19/94	17/12/24

^{1 -} these compounds coelute ND - not detected at detection limit times -limit 2 - these compounds coelute a - below normal laboratory background levels

I - minture of isomers and coelute

^{4 -} these compounds coelute

Table 1. Analysis Type: 501 Fesults continued

Sample T.pa: Sample ID#:	24N 000653	LAN 300 <b>554</b>	_4N 00655	SAN PAGESE	057
Compound		Concen	tration uş		
Thioromethane	ND	N D	NE	N0	
Bromomethane	ND	ND	ND	N2	
4 Dichlorodifluoromethane	ND	ND	ND	NO	
4 Vinvi Chiorise	ND	ND	ND	NI.	-
Chloroethane	ND	ND	NO	NI.	Ē
Meth-lene Shipride	i.0 a	1.0 a	ND	ND	. 😴
Triphlorofluoromethane	ND	ND	ND	٧Đ	=
1.1-Dichloroethene	ND	ND	ND	ND	, <del>T</del>
i.i-Dishiproethane	ND	ND	ND	NS	. =
trans-1,2-0:chloroethene	ND	ND	ND	NO.	
Ihloro∻orm	ND	ND	N D	ND	. 1
1,2-Dithloroethane	ND	ND	ND	٧D	. =
1,1,1-Trichlordethane	ND	ND	ND	พอ	. 5
Carbon Tetrachionide	ND	ND	ND	ΝĒ	w.
Bromodichloromethace	ND	ND	ND	40	*
1,2-Bizhloropropane	ND	ND	ND	ΝĐ	-
trans-1.I-Dichloropropene	МÐ	ND	ND	ND	<del>-</del>
Trichloroethene	NO	ND	ND	75.5	-
1 Dibromochloromethane	ND	ND	N D	VÐ	, £
i i.i.l-Trichlordethane	ND	ND	ND	<b>√</b> 0	
1 cis-1,I-Dichloropropene	ND	ND	ND	45	-
1-3hlordethvlvinvlether	ND	NΒ	ND	N2	T .
Bramoform	ND	N D	ND	V0	
1 1.1.1.1-Tetrachloroethane	ND	ND	ΝĎ	55	÷
2 Tetrachlorsethene	ND	В	ND	٧E	= =
Ihlorobensen <b>e</b>	ND	ND	49	NO	Ŧ
I Dichlorobenzenes	ND	ND	ND	NO.	

Detection limit factor:	1.00	1.00	1.00	10.90
Surrogate Recovery %:	72	57	96	67
Analysis data:	12/19/85	12/19/84	12/23/84	17/27 86

^{1 -} these compounds coelute ND - not detected at detection limit times matrix 2 - these compounds coelute a - below normal laboratory background levels

^{3 -} mixture of isomers and coelute

^{4 -} these compounds coelute

Aeroviroomerr 8612-927 File 6 1.2274

Table 1. Analysis Type: 601 Results (continued)

	Sample Type: Sample ID#:	LAN 0006 <b>5</b> 7	LAN 000658	LAN 000559	LAN 000660	3E T
					7	
	Compound		Concer	ntration ug.	L	
	Shloromethane	ND	ND	ND	ND	. 5
	Bromomethane	ND	ND	ND	ND	
4	Dichlorodifluoromethane	ND	ND	ND	M D	0.5
4	Vinvl Chloride	ND	ND	ND	ND	1.5
	Chloroethane	ND	ВN	ND	ND	9.5
	Methylene Chloride	0.6 a	. ND	ND	0.8 a	0.5
	Trichiorofluoromethane	ND	ND	ND	N D	<u>-</u>
	1,1-Dichloroethene	ND	ND	ND	ND	0.5
	1,1-Dichloroethane	ND	N D	ND	ND	2.5
	trans-1,2-Dichloroethene	ND	ND	ND	ND	0.5
	Chloroform	ND	ND	ND	1.9	9.5
	1,2-Dichloroethane	ND	ND	ND	ND	0.5
	1,1,1-Trichloroethane	ND	ND	ND	ND	9.5
	Carbon Tetrachloride	ND	ND	ND	ND	0.5
	Bromodichloromethane	ND	ND	ND	ND	
	1,2-Dichloropropane	ND	ND	ND	ND	0.5
	trans-1,3-Dichloropropene	ND	ND	ND	ND	-
	Trichloroethene	0.9 n	25	35	ND	. 5
!	Dibromochioromethane	ND	ND	ND	ND	1.5
	1,1,2-Trichloroethane	ND	ND	ND	ND	: . 5
	cis-1,3-Dichloropropene	ND	ND	ND	N.S	).5
	2-Chloroetnylvinyletner	ND	ND	ND	ND	9.5
	Bromoform	ND	ND	ND	ND	0.5
2	1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	3.5
2	Tetrachloroethene	ND	ND	ND	ND	9.5
	Chlorobenzene	ND	ND	ND	ND	0.5
3	Dichlorobenzenes	ND	ND	ND	ND	0.5

Detection limit factor:	1.00	2.50	1.00	1.00
Surrogate Recovery %:	105	98	101	91
Analysis date:	12/22/86	12/23/86	12/23/86	12/23/86

^{1 -} these compounds coelute ND - not detected at detection limit times factor 2 - these compounds coelute a - below normal laboratory background levels

^{3 -} mixture of isomers and coelute

^{4 -} these compounds coelute

Table 1. Analysis Type: 501 Results continued

	Sample Type: Sample ID#:	24N 200551	DET 303333
	Compound	Concentrati	on ug/L
	Chloromathane	סר	1.5
	Eromomethane	ND	⊹.5
1	Dishlorodifluoromethane	ΝО	ુ. 5
4	/inyl Chloride	ND	<b>∍.5</b>
	Chiprosthane	ND	9.5
	Methylene Chloride	ND	∘.5
	Trichlorofluoromethane	ND	0.5
	1.1-Dichloroethene	ND	9.5
	1.1-Disaloroethane	ND	0.5
	trans-1,2-Dichloroethene	٩D	0.5
	Chloroform	ND	0.5
	1.2-Dichloroethane	ПD	≥.5
	1.1.1-Trichloroethane	ND	∘.5
	Caroon Tetrachloride	ND	0.5
	Bromodichloromethane	ND	ં.5
	1.1-Bichloropropane	מא	0.5
	trans-1,J-Dichloropropene	NB	9.5
	Tripplordethene	130	⊹.5
	Dipromponioromethane	ND	0.5
:	1,1,2-Trichlordethane	N D	ં.5
:	ois-i.I-0ichlaraprapene	ND	ે.5
	1-Shiproethylvinylether	N D	0.5
	Bromoform	ND	0.5
2	1,1,2,3-Tetrachloroethane	ND	0.5
2	Tetrachloroethene	ND	0.5
	Chlorobeszene	ND	0.5
-	Dichlorogenzenes	ND	0.5

2.50 Detection limit factor:

Surrogate Recovery %: 92

Analysis date: . 12/23/86

1 - these compounds coelute ND - not detected at detection limit times fatting 2 - these compounds coelute a - below normal laboratory background levels

I - mixture of isomers and coelute

4 - these compounds coelute

Table 1. Analysis Type: 501 2A

Sample Type: Sample II#:	MB1	MB1 999903	<b>#</b> 87 209903	200 000⊌57	25 ⁻
Jampound		Conce	ntration ig	_	
Inlanametrane	NO	ND	NC	ND:	, :
Bromomethane	ND	ND	ND	ND	, =
4 Dishlorodifluoromethane	NÐ	ND	ND	NI	, Ξ
4 /invl Chloride	ND	ND	ND	NO	. Ξ
Chiorcethane	ND	ND	NE	NO	, ፤
Methylene Chloride	ND	2.3 a	NO	ND	<u> </u>
Trichlorafluoromethane	ND	ND	ND	,4D	, 🕏
1.1-Dichlorbethene	ND	αν	ND	VD.	.5
1,1-Bishlorsethane	ND	ND	ND	ND	1.₹
trans-1.2-Bichlorbethene	NЭ	ND	ND	۲aD	. 5
Chlaratorn	ND	ND	NO	ND	9.€
1,2-Displansethane	מא	ND	ND	N⊃	. Ē
1.1.1-Trichlordethane	ND	ND	ND	ND	1. €
Saroon Tetrachloride	מא	ND	ПD	<b>N</b> I	, =
Bromodishloromethane	ND	ND	ND	NE	1 - 1
1.2-3:inloropropane	ND	ND	NO	42	Ŧ
trans-1.I-Dichloropropene	ND	ND	٩D	ΝĒ	· 5
Triphloroethene	ND	٧D	ND	7.7	. 3
1 Dipromochioromethane	ND	ND	ND	45	•
1 1,1,2-Trichloroethane	ND	ND	ND.	NO.	-
l cis-1.J-Dichloropropene	ND	ND	ND	٧Ĉ	·
2-Onlordethylvinylether	ND	ND	ND	ND	=
Bremoform	ND	ND	N D	ND	1, Ξ
2 1,1.2,2-Tetrachloroethane	ND	ND	ND	NÖ	. 5
2 Tetrachloroethene	ND	ND	ND	N D	=
Shlorobenzene	ND	ND	NO	ND	, <del>-</del>
I Dichlarabenzenes	ND	ND	ND	NE	1, =

Detection limit factor:	1.00	1.00	1.00	1.70
Surrogate Recovery %:	70	97	75	:00
Analysis data:	17/19/86	12/22/86	*n/nt/ <b>q</b> 4	10/03/86

^{1 -} these compounds coelute - ND - not detected at detection limit times factor 2 - these compounds coelute - a - below normal laboratory background levels T - mixture of isomers and coelute

^{4 -} these compounds coelute

Table 2. Analysis Type: 501 3A

	Sample Type: Sample ID#:	<u>ig</u> e 000549	#5 <u></u> 909549	303330 CE.
	Compound	Conc	entration	ug/L
	Coloromethane	97 Y	: :)	9.5
	Bromomethane	97. %	1.0	3 3.5
4	Dichlorodifluoromethane	120 %	1.7	s 0.5
4	Vinvl Chioride	120 %	1.0	s 1).5
	Chloroethane	व्य ५	1.0	s 3.5
	Methylene Chloride	201 1	<u>.</u> 5	s ·).5
	Trichlorofluoromethane	110 7	. 5	s ->.5
	1,1-Dichloroethene	110 %	. 5	s 9.5
	1.1-Dichloroethane	110 7	. 5	s 0.5
	trans-1.2-0:chloroethene	190 %	• 5	s 0.5
	Chioroform	110 %	. 5	5 0.5
	1.2-Bichloroethane	130 7	. 5	s 9.5
	1,1,1-Trichloroathane	110 %	. 5	s 0.5
	Carbon Tetrachloride	119 3	. 5	s 0.5
	Bromodichloromethane	120 3	. 5	s 0.5
	1.2-Dichipropropane	110 7	<b>.</b> 5	s 0.5
	trans-1.3-Dichloropropene	100 3	4. 5	s 0.5
	Trichloroethene	110	% 5	s 9.5
1	Dipromochloromethane	100.7	. 5	s 0.5
:	1,1,2-Trichloroethane	100	<b>.</b> 5	s 3.5
1	cis-1,3-Dichloropropene	100 7	<b>.</b> 5	s 0.5
	2-Chioroethylvinylether	110.3	<b>4.</b> 5	5 0.5
	Bromoform	120 1	v. 5	s 9.5
2	1.1.2.2-Tetrachloroethane	97 .	<b>4</b> 5	s 0.5
-	Tatrachlorsethene	97 *	<b>4</b> 5	s 0.5
	Chlorobenzene	100	<u>.</u> 5	5 0.5
-	Dichloropenzenes	110 1		5 9.5

Detection limit factor: 1.00 1.00

Surrogate Recovery %: 104

Analysis date: 12/23/86 12/23/86

1 - these compounds coelute ND - not detected at detection limit times result 2 - these compounds coelute a - below normal laboratory background levels

3 - mixture of isomers and coelute s - amount spiked in sample

4 - these compounds coelute % - percent recovery from spiled sample



AeroVirsnment 825 Myrtle Avenue Monrovia. Ca 91016 January 12, 1987 Acurex ID#: Mather AFB File CON601A

Attention: Chris Lovdahl

Subject: Confirmation of Forty-three water samples

for Volatile Halogenated Organics, Received 11/12/86

through 12/15/86

Fort, three water samples were confirmed for halogenated volatile organics according to EPA Method 501 (Federal Register, Volume 49 #209, October 26, 1934; page 29). Results are presented in Table 1. Quality assurance data is presented in Table 2. The method can be summarized as follows:

> Helium is bubbled through a volume of water contained in a specially designed purging chamber at ambient temperature. The purgable halogenated organic compounds are efficiently transferred from the aqueous phase to the vapor phase. The vapor is swept through a sorbent column where the purgeables are trapped. After purging is completed, the sorbent column heated and back flushed with helium to desorb the purgeables onto a gas encomatographic column. The gas encomatograph is temperature programmed to separate the purgeable which are then detected with a Hall detector run in series with a photoionization detector. SP-1000 on Carbopak B is used for the primary analysis. Confirmations are run using a Hall detector alone and a column containing n-octane on Porasil C.

if you should have any questions, please do not hesitate to call.

Submitted by: Sarah Schoen, Ph.D.

Staff Chemist

Greg Nicoll

Project Chemist

These results were obtained by following standard laboratory procedures: the liability of Acurex Corporation shall not exceed the amount paid for this report. In no event shall Acurex be liable for special or consequential damages.

Table 1. Analysis Type: 601 Confirmations

Sample Type:	LAC	LAC	LAC	LAE	DET
Sample ID#:	000751	000752	000758	000761	555050
Compound		Concer	ntration ug/	/ <b>L</b>	
Chicromethane	NC	NC	NC	NC	0.5
Bromomethane	NC	NC	NC	NC	⊹.5
Dichlorodifluoromethane	NC	NC	NC	NE	1.5
Vinyl Chloride	NC	NC	NC	NC	9.5
Chloroethane	NC	NC	NC	NC	0.5
Methylene Chloride	NC	NC	NC	NC	).5
Trichlorofluoromethane	NC	NC	NC	NC	0.5
1,1-Dichloroethene	NC	NC	NC	NC	0.5
1 1.1-Dichloroethane	NC	NC	NC	NC	9.5
trans-1,2-Dichloroethene	NC	NC	NC	NC	0.5
Chloroform	NC	NC	NC	NC	9.5
1,2-Dichloroethane	NC	NC	NC	NC	ે.5
1 1,1,1-Trichloroethane	NC	NC	NE	NC	0.5
Carbon Tetrachloride	NC	NC	NC	NC	0.5
2 Bromodichloromethane	NC	NC	NC	NE	).5
1.2-Dichloropropane	NC	NC	NC	NC	₁.5
trans-1.3-Dichloropropene	NC	NC	NE	NC	0.5
1 Trichloroethene	ND	4.1	150	1000	).5
Dipromochioromethane	NC	NC	NC	NC	9.5
1,1,2-Trichloroethane	NC	NC	NC	NC.	.5
cis-1.3-Dichloropropene	NC	NC	NC	NC	5.5
2-Chloroethylvinylether	NC	NC	NC	NC	∴.5
3 Bromoform	NC	NC	NC	NC	0.5
4 1,1,2,2-Tetrachloroethane	NC	NC	NC	NC	€.≣
2 Tetrachloroethene	NC	NC	NC	NC	0.5
3 Chlorobenzene	NC	NC	NC	NC	).5
4 Dichlorobenzenes	NC	NC	NC	NC	

Detection limit factor:	1.00	1.00	5.00	10.00
Surrogate Recovery %:	84	71	76	82
Analysis date:	11/17/86	11/17/86	11/18/86	11/18/86

^{1 -} these compounds coelute

100

^{2 -} these compounds coelute

^{3 -} these compounds coelute

^{4 -} these compounds coelute

^{17700 1171700 11710000} 

ND - not detected at detection limit times factor a - below normal laboratory background levels

NC - not being confirmed

Table 1. Analysis Type: 601 Confirmations (continued)

Sample Type: Sample ID#:	LAC 000762	LAC 0007 <b>54</b>	LAC 0007 <b>65</b>	LAC 000766	0E* 900490	
Compound		Conce	ntration ug	L		
Chloromethane	NC	NC	NC	NC	.:	
Bromomethane	NC	NC	NC	NC	₹.5	
Dichlorodifluoromethane	NC	NC	NC	NE	١. ٤	
vinyl Chloride	NC	NC	NC	NC	, 5	
Chloroethane	NC	NC	NC	NC	0.5	
Methylene Chloride	NC	NC	NC	NC	う. 5	
Trichlorofluoromethane	NC	NC	NE	NC	0.5	
1.1-Dichloroethene	NC	NC	NC	NC	0.5	
1 1.1-Dichloroethane	NC	NC	NC	NC	5.5	
trans-1,2-Dichloroethene	NC	NC	NC	NC	€.5	
Chloroform	NC	NE	NC	NC	).5	
1.2-Dichloroethane	NC	NC	NC	NC	9.5	
1 1,1,1-Trichloroethane	NC	NC	NC	NC	0.5	
Carbon Tetrachloride	NC	NC	NC	1.2	9.5	
2 Bromodichloromethane	NC	NC	NC	NC	5	
1,2-Dichloropropane	NC	NC	NC	NC	:.5	
trans-1.3-Dichloropropene	NC	NC	NC	NC	₹.5	
1 Trichloroethene	1000	1.7	ND	2.1		
Dibromochloromethane	NC	NC	NC	NC	>.5	
1.1.2-Trichloroethane	NC	NC	NC	NC	0.5	
cis-1,3-Dichloropropene	NC	NC	NC	NC	9.5	
2-Chloroethylvinylether	NC	NC	NC	NC	:.5	
3 Bronaforn	NC	NE	NC	NC	:.5	
4 1,1,2,2-Tetrachloroethane	NC.	NC	NC	ND	0.5	
2 Tetrachloroethene	NC	NC	NC	8.2	0.5	
I Chlorobenzene	NC	NC	NC	NC	).5	
4 Dichlorobenzenes	NC	NC	NC	NC	:.5	

Detection limit factor:	10.00	1.25	1.00	1.00
Surrogate Recovery %:	82	58	64	77
Analysis dates	11/19/84	11/18/84	11/18/86	11/18/86

^{4 -} these compounds comiute

^{1 -} these compounds coelute ND - not detected at detection limit times factor
2 - these compounds coelute a - below normal laboratory background levels
3 - these compounds coelute NC - not being confirmed

Table 1. Analysis Type: 601 Confirmations continued)

Sample Type: Sample ID#:	LAC 000770	LAC 000772	LAC 000773	LAC 000775	087 999999
Compound		Concen	tration ug.	/L	
Chloromethane	NC NC	NC	NC	NC	
Bromomethane	NC	NC	NC	NC	
Dichlorodifluoromethane	NC	NC	NC	NC	. 5
Vinyl Chloride	NC	NC	NE	NC	
Chloroethane	NC	NC	NC	NC	-
Methylene Chloride	NC	NE	NC	NC	•
Trichlorofluoromethane	NC	NC	NC	NC	),5
1,1-Dichloroethene	NC	NC	0.8	NC NC	
1 1.1-Dichloroethane	NC	NC	20	NC	0.5
trans-1,2-Dichloroethene	NC	NC	ND	NC	0.5
Chloroform	NC	4.0	NC	NC	).5
1.2-Dichloroethane	NC	NC	NC	NC	•
1 1.1,1-Trichloroethane	ND	46-12	_	ND	).5 }.5
Carbon Tetrachloride	NC	NC	NC	NC	5
2 Bromodichloromethane	NC	NE	NC	NC	
1.2-Dichloropropane	NC	NC	NC	NC NC	5
trans-1.3-Dichloropropene	NC.	NC	NC NC	NC	. 5
l Trichloroethene	NC	ND	20	NC	- =
Dibromochloromethane	NC	NC	NC	NE	
1,1,2-Trichloroethane	NC.	NC	NC NC	NE NE	1.5
cis-1,3-Dichloropropene	NC	NC	NC	NE	
2-Chloroethylvinylether	NC	NC	NC	NC	5
3 Bromoform	NC NC	NE	NC	NC	.5
1 1.1.2.2-Tetrachloroethane	NC	NC NC	ND	NC	).E
? Tetrachloroethene	NC	NC	3.5	NC NC	
3 Chlorobenzene	NC NC	NC NC	NC L	NC NE	. 5
Dichlorobenzenes	NC	NC NC	NC NC	NC NC	 3. 5

Detection limit factor:	1.00	1.00	1.00	1.00
Surrogate Recovery %:	62	94	93	70
Analysis date:	11/18/84	11/20/86	12/3/86	11/19/86

^{1 -} these compounds coelute ND - not detected at detection limit times rattor 2 - these compounds coelute a - below normal laboratory background levels

^{3 -} these compounds coelute

NC - not being confirmed

^{4 -} these compounds coelute

Table 1. Analysis Type: 601 Confirmations (continued)

	Sample Type: Sample ID#:	LAC 000779	LAC 000781	LAC 000787	LAC 000789	DET
	Compound		Conce	ntration ug.	/L	
	Chloromethane	NC	NC	NC	NC	٠.5
	Bromomethane	NC	NC	NC	NC	),5
	Dichlorodifluoromethane	NC	NC	ND	NC	. 3
	Vinyl Chloride	NC	NC	0.8	NC	0.5
	Chloroethane	NC	NC	NC	NC	0.5
	Methylene Chloride	NC	NC	NC	NC	0.5
	Trichlorofluoromethane	NC	NC	NC	NC	0.5
	1,1-Dichloroethene	NC	NC	NC	NC	0.5
1	1,1-Dichloroethane	NC	NC	NC	NE	9.5
	trans-1,2-Dichloroethene	NC	NC	NC	NC	ે.5
	Chloraform	NC	NC	NC	NC	0.5
	1,2-Dichloroethane	NC	NC	NC	NC	û.5
1	1,1,1-Trichloroethane	ND	ND	NC	3.1	0.5
	Carbon Tetrachloride	NC	NC	NC	NC	0.5
2	Bromodichloromethane	NC	NC	NC	NC	0.5
	1,2-Dichloropropane	NC	NC	NC	NC	J. 5
	trans-1,3-Dichloropropene	NC	NC	NC	NC	0.5
1	Trichloroethene	NC	NC	4.9	3.1	0.5
	Dibromochloromethane	NC	NC	NC	NC	0.5
	1,1,2-Trichloroethane	NC	NC	NC	NC	0.5
	cis-1,3-Dichloropropene	NC	NC	NC	NC	0.5
	2-Chloroethylvinylether	NC	NC	NC	NC	0.5
3	Bromoform	NC	NC	NC	NC	0.5
4	1,1,2,2-Tetrachloroethane	NC	NC	ND	NC	0.5
2	Tetrachloroethene	NC	NC	ND	NC	ე. 5
3	Chlorobenzene	NC	NC	NC	NC	଼. 5
4	Dichlorobenzenes	NC	NC	NC	NC	. 5

Detection limit factor:	1.00	1.00	1.00	1.00
Surrogate Recovery %:	75	77	67	63
Analysis date:	11/20/86	11/20/86	11/21/86	11/21/86

^{3 -} these compounds coelute - NC - not being confirmed

^{4 -} these compounds coelute

^{1 -} these compounds coelute ND - not detected at detection limit times factor 2 - these compounds coelute a - below normal laboratory background levels

Table 1. Analysis Type: 601 Confirmations (continued)

	Sample Type: Sample ID#:	LAC 000796	LAE 000797	EAC 000798	EAS 0007 <b>9</b> 9	357
	Compound		Cancer	ntration ug/	L	
	Chloromethane	NC	NC.	NC	NC	
	Bromomethane	NC	NC	NC	NC	٠. ٥
	Dichlorodifluoromethane	NC	NC	ND	ND	٠, 5
	Vinyl Chloride	NC	NC	5.1	4.7	. =
	Chloroethane	NC	NE	NC	NE	, =
	Methylene Chloride	NC	NE	NC	NC	₹
	Trichlorofluoromethane	NC	NC	NC	NC	ν.Ξ
	1.1-Dichloroethene	NC	NC	NC	NC	. 5
1	1.1-Dichloroethane	NC	NC	1 4	18	: . 5
	trans-1,2-Dichloroethene	NE	NE	ND	ND	.5
	Chloroform	NC	ND	NC	NC	1.5
	1.2-Dichloroethane	NC	NC	3.0	2.8	:,5
1	1,1,1-Trichloroethane	NC	NC	NC	NE	
	Carbon Tetrachloride	NC	NC	NC	NC	. 5
2	Bromodichloromethane	NC	NC	NC	NO	5
	1.2-Dichloropropane	NC	NC	0.9	ა. s	1.3
	trans-1.3-Dichloropropene	NC	NC	NC	NC	. 5
1	Trichloroethene	11	NC	1.4	19	2
	Dibromochloromethane	NC	NC	NC	NC	
	1,1,2-Trichloroethane	NC	NC	NC	NC	. 1
	cis-1,3-Dichloropropene	NC	NC	NC	NC	. =
	2-Chloroethylvinylether	NC	NE	NC	NC	
3	Bromoform	NC	NC	NE	NC	
4	1,1.2.2-Tetrachloroethane	ND	NC	ND	ND	
2	Tetrachloroethene	2.0	NC	1.2	1.0	1.5
3	Chloropenzene	NE	NC	NC	NC	=
4	Dichlorabenzenes	NC	NC	ND	ND	5

Detection limit factor:	1.00	1.00	1.00	1.00
Surrogate Recovery %:	7 <b>9</b>	63	77	68
Analysis date:	11/24/86	11/24/86	11/24/86	11/24/86

^{3 -} these compounds coelute NC - not being confirmed

^{4 -} these compounds coelute

^{1 -} these compounds coelute ND - not detected at detection limit times rattor 2 - these compounds coelute a - below normal laboratory background levels

Table 1. Analysis Type: 601 Confirmations *continued?

Sample Type: Sample ID#:	CAC 000801	LAC 000602	LAC 000607	LAC 000608	000000 000000
Compound		Concer	stration ug.	L	
Shloromethane	NC	NC	NC	NC	).5
Bromomethane	NC	NC	NC	NC	:.5
Dichlorodifluoromethane	NC	NC	NC	NC	5
Vinyl Chloride	NC	NC	NC	NC	9.5
Chloroethane	NC	NC	NE	NE	∴.5
Methylene Chloride	NC	NC	NC	NC	0.5
Trichlorofluoromethane	NC	NC	NC	NE	0.5
1,1-Dichlorsethene	NE	NC	NC	מא	0.€
1 1.1-Dichloroethane	NC	NC	NC	58	0.5
trans-1,2-Dichloroethene	NC	NC	ND	ND	0.5
Chlaroform	1.2	NC	NC	NE	0.5
1.2-Dichloroethane	NC	NC	NC	NC	្.5
1 1.1.1-Trichloroethane	ND	NC	NC	NC	).5
Carbon Tetrachloride	NC	NC	NC	NC	J. 5
2 Bromodichloromethane	NC	NC	NC	NC	1.5
1.2-Dichloropropane	NC	NC	NE	NC	:.5
trans-1,3-Dichloropropene	NC	NC	NC	NC	6.5
1 Trichlorgethene	NC	5.0	34	68	0.5
Dibromochloromethane	NE	NC	NC	NC	: =
1,1,2-Trichloroethane	NC	NC	NC	NC	:.5
cis-1,J-Dichloropropene	NE	NC	NC	NC	0.5
2-Chlorosthylvinylether	NC	NC	NC	NC	:.5
3 Bromoform	NE	NC	NC	NC	1.5
4 1,1,2,2-Tetrachloroethane	NC.	ND	ND	ND	). Ē
2 Tetrachioroethene	NE.	9.2	11	1.4	3. €
J Chlorobenzene	NC.	NC.	NC	NC.	C. 5
4 Dichlorobenzenes	NC	NE	NC	NC	5

Detection limit factor:	1.00	1.00	1.00	1.00
Surrogate Recovery %:	54	78	82	79
Analysis date:	11/24/86	12/12/86	12/12/86	12/15/86

^{1 -} these compounds coelute ND - not detected at detection limit times factor 2 - these compounds coelute a - below normal laboratory background levels 3 - these compounds coelute NC - not being confirmed

^{4 -} these compounds coelute

Table 1. Analysis Type: 501 Confirmations (continued)

Sample Type: Sample ID#:	CAC 000 <b>014</b>	LAC 000617	LAC 000621	LAC 000628	CET gaaaga
Compound		Conce	ntration ug	'L	
Chloromethane	NC	NC	NC.	NC.	
Bromomethane	NC	NC	NC	NC	• •
Dichlorodifluoromethane	ND	NC	NC	NC.	•
Vinvl Chloride	1.3	NC	NC	NC.	-
Chloroethane	NE	NC	NC	NC	
Methylene Chloride	NC	NC	NC	NC	
Trichlorofluoromethane	NC	NC	NC	NC	. 5
1.1-Dichlorgethene	NC	NC	NC	NC	0.5
1 1.1-Dichloroethane	NC	NC	NC	NC	
trans-1.2-Dichloroethene	ND	NC	NC	NC	7.5
Chlaraform	NC	NC	1.5	NC	
1.2-Dichloroethane	NC	NC	NC	3.7	: 5
1 1.1.1-Trichloroethane	NC	NC	NC	NC	. 5
Carbon Tetrachloride	NC	NC	NC	NC	=
2 Bromodichloromethane	NC	NE	NC	NC	و
1.2-Dichloropropane	NC	NC	NC	NC	· · ·
trans-1,J-Dichloropropene	NE	NC	NE	NE	. 5
1 Trichloroethene	21	NC	NC	NC	5.5
Dibromochloromethane	NC	NO	NE	NC	. 5
1,1,2-Trichloroethane	NC	NC	NC	NE	5
cis~1,3-Dichloropropene	NC	NC	NC	NE	
2-Chloroethylvinyletner	NC	NC	NC	NC	0.5
3 Bromoform	NC	NC	NC	NE	€.5
4 1,1,2,2-Tetrachloroethane	ND	ND	NC	NC	, . <del>5</del>
2 Tetrachloroethene	2.5	1.1	NC	NC	. 5
3 Chlorobenzene	NC	NC	NC	NC	:, ₹
4 Dichlorobenzenes	NC	NC	NC	NC	5

Detection limit factor:	1.00	1.00	1.00	1.00
Surrogate Recovery %:	70	79	92	86
Analysis date:	12/18/86	12/15/86	12/15/86	12/15/86

^{1 -} these compounds coelute ND - not detected at detection limit times factor 2 - these compounds coelute a - below normal laboratory background levels

^{3 -} these compounds coelute NC - not being confirmed

^{4 -} these compounds coelute

Table 1. Analysis Type: 601 Confirmations (continued)

	Samole Type: Sample 15#:	848 000631	LAC 000632	LAC 900634	LAC 000635	DE - 7 <b>9</b> 9959
	Compound		Concer	ntration ug	L	
	Chloromethane	NC	NC	NC	NC	.5
	Gromomethane	NC	NĒ	NČ	NĒ	٠٠
	Dichlorodifluoromethane	NC	NE	ND	NC	<u>.</u> €
	/inyl Chloride	NC	NC	0.8	NC	
	Chloroethane	NC	NC	NC	NC	1.5
	Methylene Chloride	NC	NC	NC	NC	5
	Trichlorofluoromethane	NC	NC	NE	NC	4.5
	1.1-Dichiorbethene	NC	NC	NC	NC	0.5
1	1,1-Dichloroethane	NC	NC	NC	NC	0.5
	trans-1,2-Dichloroethene	NC	NC	ND	NC	5.5
	Chloroform	NE	NC	NC	ND	0.5
	1.2-Dichloroethane	NC	NC	NC	NC	0.5
1	1,1,1-Trichloroethane	NC	NC	NC	NC	0.5
	Carbon Tetrachloride	NC	NC	NC	NC	0.5
-	Bromodichloromethane	NC	NC	NC	NC	0.5
	1.2-Dichloropropane	NC	NC	NC	NC	0.5
	trans-1,3-Dichloropropene	NC	NC	NC	NC	1.5
1	Trichloroethene	3.1	12	6.8	NC	9.5
	Dibromochloromethane	NC	NC	NC	NE	0.5
	1,1,2-Trichloroethane	NC	NE	NC	NC	. <u> </u>
	cis-1,3-Dichloropropene	NC	NC	NC	NC	0.5
	2-Chloroethylvinylether	NC	NC	NC	NC	0.5
3	Bromoform	NC	NC	NC	NC	0.5
4	1.1.2.2-Tetrachloroethane	ND	ND	ND	NC	0.5
2	Tetrachloroethene	ů.9	1.7	0.5	NC	0.5
5	Chlorobenzene	NC	NC	NC	NC	Ů.5
4	Dichlorobenzenes	NC	NC	NC	NC	0.5

Detection limit factor:	1.00	1.00	1.00	1.00
Surrogate Recovery %:	80	80	87	89
Analysis date:	12/16/86	12/16/86	12/16/86	12/16/86

^{2 -} these compounds coelute 3 - these compounds coelute

^{4 -} these compounds coelute

^{1 -} these compounds coelute ND - not detected at detection limit times factor

a - below normal laboratory background levels

NC - not being confirmed

Table 1. Analysis Type: 601 Confirmations (continued)

						E∺≂
	Sample Type:	LAC	LAC	LAC	LAC	DET
	Sample ID#:	000634	000638	000644	000647	929933
	Sompound		Conce	ntration ug/	L	
	Chloromethane	NC	NC	NC	NC NC	
	Bromomethane	NC	NC	NC	NC	).∃
	Bichlorodifluoromethane	NC	NC	NC	NC	. 5
	Vinyl Chloride	NC	NC	NC	NΕ	, 5
	Chloroethane	NC	NC	NC	NE	(.5
	Methylene Chloride	NC	NC	NC	NC	€.5
	Trichlorofluoromethane	NC	NC	NC	NC	. 5
	1.1-Dishloroethene	NC	NC	NC	NC	€.5
1	1,1-2:chloroethane	NC	NC	NC	NC	0.5
	trans-1.2-Bichloroethene	NC	NC	NC	NC	٥.5
	Chiproform	4.2	NC	NC	NC	9.5
	1.2-Dichlorbethane	NC	NC	NC	NC	1.5
1	1,1,1-Trichloroethane	0.8	ND	NC	NC	(.5
	Carbon Tetrachloride	NC	NC	NC	NC	).5
2	Bromodichloromethane	NE	NC	NC	٧C	0.5
	1,2-Dichloropropane	NC	NC	NC	NŪ	
	trans-1,3-Dichloropropene	NC	NC	NC	NC	. ₹
1	Trichloroethene	NC	NC	4.3	2.1	1,5
	Dipromochloromethane	NC	NC	NC	NC	5
	1,1.2-*richloroethane	NC	NC	NC	٧C	, :
	cis-1.3-Dichloropropene	NC	NE	NE	ВИ	. 5
	1-Chloroethylvinylether	NC	NC	NC	NC	, =
3	Bromoform	NE	NE	NC	N C	. =
4	1,1,2,2-Tetrachloroethane	NC	NC	NC	NE	€.5
2	Tetrachioroethene	NC	NC	NC	NC	. 5
7	Chlorobenzene	NE	NC	NC	NC	٠. ت
4	Dichloropenzenes	NC	NC	NC	NE	. 5

Detection limit factor:	1.00	1.00	1.00	1.00
Surrogate Recovery %:	81	70	60	95
Analysis date:	12/16/86	12/16/86	12/19/86	12/19/86

^{1 -} these compounds coelute

^{2 -} these compounds coelute 3 - these compounds coelute

^{4 -} these compounds coelute

ND - not detected at detection limit times factor

a - below normal laboratory background levels
 NC - not being confirmed

Table 1. Analysis Type: 601 Confirmations (continued)

	Sample Type: Sample ID#:	LAC 000648	LAC 000656	LAC 0006 <b>5</b> 7	LAC 000658	3E7 998888
			Concer	ntration ug.	/L	
	Chloromethane	NC	NC	NC	NC	5
	Bromomethane	NC	NC	NC	NC	ء و
	Bichlorodifluoromethane	NC	NC	NC	NE	3.5
	Vinyl Chloride	NC	NC	NC	NC	. 5
	Chloroethane	NC	NC	NC	NC	
	Methylene Chloride	NC	NC	NC	NC	3.5
	Trichlorofluoromethane	NC	NC	NC	NC	5
	1.1-Dichloroethene	NC	NC	NC	NC	0,5
1	1.1-Dichloroethane	NE	NC	NC	NC	. 5
	trans-1,2-Dichloroethene	NC	NC	NC	NC	0.5
	Chloroform	NE	NE	NC	NC	0,5
	1,2-Dichloroethane	NC	NC	NC	NC	
1	1.1.1-Trichloroethane	NC	NC	NC	NC	.5
	Carbon Tetrachloride	NC	NC	NC	NE	. =
2	Bromodichloromethane	2.1	NΘ	NE	NC	0.5
	1.2-Dichloropropane	NC	NC	NC	NC	. 5
	trans-1,J-Dichloropropene	NC	NE	NC	NE	, 5
:	Trichloroethene	NC	790	ND	68	0,≣
	Dibromochloromethane	8.0	NE	NC	NC	. =
	1.1.2-Trichloroethane	ND	NC	NC	NC	. 5
	cis-i.J-Dichlaropropene	ND	NE	NE	NC	
	1-Chloroethylvinylether	NC	NC	NC	NC	0.5
3	Bromoform	3.0	NC	NC	NE	5
1	1,1,2,2-Tetrachloroethane	NC	NC	NC	NC	0.5
2	Tetrachioroethene	NC	NC	NC	NC	0.5
3	Chlorobenzene	NC	NC	NC	NC	5
4	Dichiorobenzenes	NC	NC	NC	NC	∅.5

Detection limit factor:	1.00	10.00	1.00	2.50
Surrogate Recovery %:	101	67	53	82
Analysis date:	12/19/86	12/22/86	12/22/86	12/22/86

^{1 -} these compounds coelute

^{2 -} these compounds coelute

^{3 -} these compounds coelute

^{4 -} these compounds coelute

ND - not detected at detection limit times factor

a - below normal laboratory background levels

NC - not being confirmed

Aerovirinter Mather AFB File CONE 10

Table 1. Analysis Type: 601 Confirmations (continued)

	Sample Type: Sample ID#:	LAC 000659	LAC 000660	LAC 000661	DET 99999
	Compound		Concer	itration ug/	L
	Chloromethane	NC	NC	NC	0.5
	Bromomethane	NC	NC	NC	0.5
	Dichlorodifluoromethane	NC	NC	NC	0.5
	Vinyl Chloride	NC	NC	NC	0.5
	Chloroethane	NC	NC	NC	0.5
	Methylene Chloride	NC	NC	NC	0.5
	Trichlorofluoromethane	NC	NC	NC	0.5
	1,1-Dichloroethene	NC	NC	NC	0.5
1	1,1-Dichloroethane	NC	NC	NC	0.5
	trans-1,2-Dichloroethene	NC	NC	NC	0.5
	Chloroform	NC	5.4	NC	ે.5
	1,2-Dichloroethane	NC	NC	NC	0.5
1	1.1.1-Trichlorgethane	NC	NC	NC	J.5
	Carbon Tetrachloride	NC	NC	NC	J.5
2	Bromodichloromethane	NC	NC	NC	0.5
	1.2-Dichloropropane	NC	NC	NC	0.5
	trans-1,3-Dichloropropene	NC	NC	NC	0.5
1	Trichloroethene	25	NC	95	0.5
	Dibromochloromethane	NC	NC	NC	0.5
	1.1.2-Trichloroethane	NC.	NC	NC	9.5
	cis-1,3-Dichlarapropene	NC	NC	NC	0.5
	2-Chloroethylvinylether	NC	NC	NC	0.5
7	Bromoform	NC	NC	NC	0.5
4	1,1,2,2-Tetrachloroethane	NC	NC	NC	0.5
2	Tetrachloroethene	NC	NC	NC	0.5
3	Chlorobenzene	NC	NC	NC	0.5
4	Dichlorobenzenes	NC	NC	NC	0.5

Analysis date:	12/22/86	12/22/86	12/22/86
Surrogate Recovery %:	57	62	69
Detection limit factor:	1.00	1.00	1.00

^{1 ~} these compounds coelute 2 ~ these compounds coelute

^{2 ~} these compounds coelute
3 ~ these compounds coelute

^{4 -} these compounds coelute

ND - not detected at detection limit times factor

a - below normal laboratory background levels

NC - not being confirmed

Table 2. Analysis Type: 501 Confirmation C4

	ple Type:	M&1 797978	MB2 999993	MB;	MB4	CET
3 a m	ple ID#:	777770				
Com	bnucq		Concen	tration ug/l	-	
Chi	oromethane	ND	ND	ND	NE	. 5
	momethane	ND	ND	ND	٧Ď	-
Dic	hlorodifluoromethane	ND	ND	2.5	ND	Ξ.
Vin	yl Chloride	ND	ND	ND	ND	. 5
Sh1	orgethane	ND	ND	ND	ND	1.5
Met	hylene Chlori <b>de</b>	1.3 a	2.3 a	1.4 a	3.2 a	. 5
Tri	chlorofluoromethane	ND	ND	ND	ПN	1,5
1,1	-Dichloroethene	מא	ND	ND	MD	. 5
1 1.1	-Dichloroethane	ND	ND	ND	ND	. 5
tra	ns-1,2-Dichloroethene	ND	ND	ND	ND	. 5
0h1	oroform	ND	ND	ND	ND	: <u>=</u>
1,2	-Dichloroethane	ND	ND	ND	ND	0.5
1 1,1	,1-Tr::nloroethane	ND	ND	ND	ND	9.5
Car	bon Tetrachloride	םא	GN	ND	ND	∴.5
2 Bro	modichloromethane	ND	ND	ND	ND	়, ই
1,2	-Dichloropropan <b>e</b>	ND	ND	ND	ND	
tra	ns-1,I-Dichloropropene	GM	ND	ND	ND	:.5
1 751	chlorcethene	ND	ND	ND	ND	€.5
Dib	romochloromethane	ND	ND	ND	ND	0.5
1.1	,I-Trichloroethane	ND	שא	ND	GM	. 5
115	-1,T-Bichloropropene	ND	ND	ND	ND	₹.5
2-8	hloroethylvinylether	ND	ND	ND	ND	⊕.5
3 Bro	moform	ND	ND	ND	ND	
4 1.1	.2,2-Tetrachloroethane	ND	ND	ND	ND	:. ≣
2 Tet	rachloroethene	ND	ND	ND	ND	5
3 Ch1	orobeniene	ND	ND	DN	ND	્.દ
4 Dic	hlorobenzenes	ND	ND	ND	ND	5

Detection limit factor:	1.00	1.00	1.00	1.00
Surrogate Recovery %:	58	77	45	83
Analyeie date.	11/17/84	11 - 19 / 84	11/19/86	11/20/86

^{1 -} these compounds coelute

^{2 -} these compounds coelute
3 - these compounds coelute

^{4 -} these compounds coelute

ND - not detected at detection limit times factor a - below normal laboratory background levels NC - not being confirmed

Table 2. Analysis Type: 501 Confirmation QA (continued)

Sample Type: Sample ID#:	M85 999998	MB6 999998	MB7 99998	MB8 999998	08* 99999
Compound		Concen	itration ug/l	-	
Chloromethane	N D	ND	ND	ND	, 5
Bromomethane	ND	ND	ND	ND	6.5
Dichlorodifluoromethane	ND	ND	N D	5.1	5.5
Vinyl Chloride	ND	ND	ND	ND	٠, و
Shloroethane	N D	ND	ND	ND	. 5
Methylene Chloride	8.2 a	1.5 a	2.9 a	28 a	0.5
Trichlorofluoromethane	ND	ND	ND	٧D	, 5
1,1-Dichloroethene	ND	ND	ND	ND	1.5
1 1,1-Dichloroethane	ND	ND	3.0	ND	=
trans-1,2-Dichloroethene	ND	ND	ND	ND	,.5
Chloroform	N D	ND	ND	٩D	. =
1,2-Dichloroethane	ND	ND	ND	ND	ა. 5
1 1,1,1-Trichloroethane	ND	ND	3.0	ND	. 5
Carbon Tetrachloride	ND	ND	ND	ND	5
2 Bromodichloromethane	N D	ND	ND	ND	5
1,2-Dichloropropane	ND	ND	ND	ND	. 5
trans-1,3-Dichloropropene	ND	ND	ND	ND	. 5
1 Trichloroethene	ND	ND	5.0	ND	
Dibromochloromethane	ND	ND	ND	ND	٠. 5
1,1,2-Trichloroethane	ND	ND	ND	ND	5
cis-1,3-Dichloropropene	ND	ND	ND	ND	. 5
2-Chloroethylvinylether	ND	ND	ND	ND	. =
3 Bromoform	ND	ND	ПN	ND	. 5
4 1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	=
2 Tetrachlorsethene	ND	ND	ND	ND	=
3 Chlorobenzene	ND	ND	ND	ND	. 5
4 Dichlorobenzenes	ND	ND	ND	ND	. 5

Detection limit factor:	1.00	1.00	1.00	1.00
Surrogate Recovery %:	52	79	67	70
Analysis date:	11/21/86	11/24/86	12/3/86	12/12/86

^{1 -} these compounds coelute ND - not detected at detection limit times factor 2 - these compounds coelute a - below normal laboratory background levels

^{3 -} these compounds coelute

NC - not being confirmed

^{4 -} these compounds coelute

Table 2. Analysis Type: 601 Confirmation 1A (continued:

Sample Type: Sample ID#:	MBP 999398	MB10 sqqqqg	MB11 999998	MB12 999998	257
Jompaund		Concer	ntration ug/	L	
Chloromethane	ND	ND	ND	NO	1.5
Bromomethane	ND	ND	ND	NB	2.5
Dichlorodifluoromethane	ND	ND	ND	ND	=
Vinvl Chloride	ND	ND	ND	NO	0.5
Chloroethane	ND	ND	ND	ND	: , 5
Methylene Chloride	1.8 a	ND	2.7 a	2.1 a	7.5
Trichlorofluoromethane	ND	ND	ND	ND	), <b>5</b>
1,1-Dichloroethene	ND	ND	ND	ND	3.5
1 1.1-Dichloroethane	ND	ND	ND	ИD	5
trans-1.2-Dichloroethene	ND	ФИ	ND	ND	. 5
Chiproform	ND	ND	ND	ND	.5
1.2-Bichloroethane	ND	סא	ND	ND	0.5
1 1,1,1-Trichloroethane	ND	МD	ND	ND	. <b>.</b> =
Carpon Tetrachloride	ND	ND	ND	ND	0.5
2 Bromodichloromethane	ND	ND	מא	מא	. 5
1,2-9ichlorpanopane	ND	ND	ND	CM	€.5
trans-1,I-bithloropropens	ND ND	ND	ND	ND	5.5
1 Trichloroethene	ND	ND	ND	ND	. ₹
Dibromochloromethane	ND	ND	٩D	ФР	4.5
1,1,2-Trichloroethane	ND	ND	ND	40	. =
cis-1,3-Dichloropropene	ND	ND	ND	NO	. 3
2-Chioroethylvinylether	ND	ПD	ND	AD	:. €
3 Bramaform	ND	ΠD	ND	٧D	. 5
4 1,1,2,2-Tetrachloroethans	n n n	ND	ND	ND	·
2 Tetrachloroethene	ND	ND	ND	ND	, =
I Chlorobenzene	ND	ND	ND	ND	5
4 Dichlorobenzenes	ND	ND	ND	GM	∴. ₹

Detection limit factor:	1.00	1.00	1.00	1.00
Surragate Recovery %:	86	72	5 <b>9</b>	6 <b>9</b>
Analysis date:	12/15/86	12/15/86	12/18/86	12/19/86

^{1 -} these compounds coelute

^{2 -} these compounds coelute
3 - these compounds coelute

^{4 -} these compounds coelute

ND - not detected at detection limit times factor

a - below normal laboratory background levels NC - not being confirmed

Table 2. Analysis Type: 601 Confirmation SA continued)

	Sample T.pe:	MB13	DET
	Sample ID#:	999998	999999
	Compound	Concentration	on ug/L
	Chloromethane	ND	0.5
	Bromomethane	ND	0.5
	Dichlorodifluoromethane	ND	0.5
	Jinyl Chloride	ND	ა.5
	Chloroethane	ND	0.5
	Methylene Chloride	2.3 a	0.5
	Trichlorofluoromethane	ND	0.5
	1,1-Dichloroethene	ND	0.5
1	1.1-Dichloroethane	ND	0.5
	trans-1,2-Dichloroethene	ND	9.5
	Chloroform	ND	0.5
	1.2-Dichloroethane	ND	9.5
1	1,1,1-Trichloroethane	ИD	0.5
	Carbon Tetrachloride	ND	0.5
2	Bromodichloromethane	ND	ა.5
	1,2-Dichloropropane	ND	0.5
	trans-1,3-Dichloropropene	ND	0.5
1	Trichloroethene	ND	0.5
	Dipromochipromethane	ND	ა.5
	1,1,2-Trichloroethane	ND	ე.5
	cis-1,J-Dichloropropene	ND	ે.5
	2-Chloroethvlvinylether	ND	<b>0.5</b>
3	Bromoform	ND	0.5
4	1,1,2,2-Tetrachloroethane	ND	0.5
2	Tetrachloroethene	ND	ს.5
3	Chloropenzene	ND	9.5
4	Dichlorobenzenes	ND	∘.5

Detection limit factor: 1.00

74 Surrogate Recovery %:

Analysis date: 12/22/86

1 - these compounds coelute - ND - not detected at detection limit times factor

2 - these compounds coelute a - below normal laboratory background levels 3 - these compounds coelute NC - not being confirmed

4 - these compounds coelute



Energy & Environmental Division

December 3, 1986

AeroVironment, Inc. 825 Myrtle Avenue Monrovia, CA 91016

Attention: Chris Lovdahl

Subject: Analysis of Mather Air Force Base Samples

Samples were analyzed by atomic absorption spectrophotometry for arsenic using EPA method 206.2, mercury using EPA method 245.1, and selenium using EPA method 270.2. The sample preparation for arsenic and selenium determinations included concentrating the sample aliquot by a factor of five in order to obtain requested detection limits. The results are presented in Table 1 with QA results in Table 2.

Prepared by: 1 this furth pproved by:

Patrick M. Hirata

Chemist

Manager, Inorganic Chemistry

Harthar LPS November 1985

Table 1. Analysis Type: Atomic Absorption Metals Results

Bample Type: Bample ID#:	LAN 000784	LAN 000785	LAN 300786	LAN 000787	0 = 0 = <del>0</del>		
Compound	Concentration, ugL						
Arsenic, As Mercury, Mg Selenium, Se	ND ND ND	ND ND ND	ND ND ND	Д П П П	: : : :		
Detection limit factor:	1.00	1.00	1.00	1.00			
Analysis date (As.Hg): Analysis date (Se):	11/25/85 12/01/85	11/25/85 12/01/86	11/25/85 12/01/86	11/25/86 12/01/86			

Henovinoiten Mathem Hee November 1985

Table 1. Analysis Type: Atomic Absorption Metals Results

Bample Type: Bample ID#:	LÄN 0007 <b>88</b>	LAN 00078 <b>9</b>	LAN 000790	LÁN 000791	EET 999999		
Sampaund	Concentration, ugL						
Ansenic. As	ND	ND	ND	ND	2		
Mercury, Hg	ND ND	N D N D	N D N D	N D N D			
Selenium. Se	NU	NU	140	145	~		
Setection limit factor:	1.00	1.00	1.00	1.00			
Analysis date (As.Hg):	11/26/95	11/25/95	11/25/85	11/25/86			
Amalysis date (Se):	12/01/86	12/01/85	12/01/96	12/01/85			

Hendushirina in Mathen Heb November Sinci

Table 1. Analysis Type: Atomic Absorption Metals Res. 19

Sample T.pe: Sample IO#:	LAN 0007 <b>92</b>	LAN 000793	LAN 000794	. <b>∈N</b> ygg <b>795</b>	[E] qqqass		
Campound	Concentration, ugL						
Arsenic, As	ND	ND	ND	ND			
Mercury, Hg	ND	ND	פא	ND			
Selenium. Še	ND	ND	ND	ND	-		
Detection limit factor:	1.00	1.00	1.00	1.00			
Analysis date (As,Hg):	11/25/86	11/26/86	11/25/95	11/25/85			
Analysis date (Se):	12/01/86	12/01/85	12/01/86	12/01/86			

Harovirontent Mathar HPS November 1985

Table 1. Analysis Type: Atomic Absorption Metals Pas..ts

Sample Y.ce:	LAN	LÁN	LAN	LAN	5 <b>5 6 6 5 6</b>			
Sample ID#:	000796	000797	0007 <b>98</b>	000799				
Campaund	Concentration, agL							
Arsenic. As	ND	ир	ND	ND	1. i			
Mercury, Hg	ND	ар	ND	10	2. i			
Selenium, Se	ND	ир	ND	ND	2			
Detection limit factor:	1.00	1.00	1.00	1.00				
Analysis data (As.Hg):	11/25/85	11/25/85	11/25/85	11/25/85				
Analysis date (Se):	12/01/86	12/01/86	12/01/85	12/01/86				

Herbuitbert Mather Heb November 1988

Table 1. Analysis Type: Atomic Absorption Metals Res . Tr

Bampla Tupe: Bampla IU#:	LAN 00 <b>08</b> 00	LAN 000801	DET 999999
Ismasund	Concentration, ug/L		
Arsenia, As	5	ND	2
Mercur, Hg	ND	ND	1.2
Selantum, Se	ND	ND	2
Detection limit factor:	1.90	1.00	
Analysis date (As,Hg):	11/25/85	11/25/85	
Analysis date (Se):	12/01/86	12/01/86	

Herovirontett Mather AFB November 1985

Table I. Analysis Type: Atomic Absorption Metals In-

Eample Type: Sample IC#:	MB1 999999	ME2 999998	MB3 999999	LDU 0007 <b>84</b>	36T 999995		
ยือคอดนกฮ	Concentration, ugL						
Arseric, As	ND	ND	ND	NA	-		
Mercur≀, Hg	ND	NA	NA	ND	0.1		
Selenium. Se	ОИ	ND	ND	NA	Ξ		
Detection limit factor:	1.00	1.00	1,00	1.00			
Analysis date (As.Hg):	11/25/85	11/26/86	11/25/35	11/25/85			
⊣nal√sis date (Se):	12/01/86	12/01/96	12/01/86	12/01/96			

 $\ensuremath{\text{ND}}$  - not detected at detection limit times factor

NA - not analyzed

Hart Unithain Matham Hás November Lábis

Table 2. Analysis Type: Atomic Absorption Metals 14

Bample T.ce: Bample ID#:	∟0 <b>∪</b> 000790	LDU 0007 <b>75</b>	 000 <b>8</b> 01	MSL 000801	5ET 34444		
Lompound	Concentration, ugl						
Arsenic. As Mercur, Hq Selenium, Se	ND NA ND	NA ND NA	94 115 96	% 20	5		
Detection limit factor:	1.00	1.00	1,00	1.00			
Analysis date (As.Hg): Analysis date (Se):	11/26/86 12/01/86	11/25/85 12/01/86	11/26/85 12/01/86				

 $N\bar{\upsilon}$  - not detected at detection limit times factor

NA - not analyzed

% - percent recovery from spiked sample

s - amount spiked in sample



Energy & Environmental Division

December 18, 1986

AeroVironment, Inc. 325 Myrtle Avenue Monrovia, CA 91016

Attention: Chris Lovdanl

Subject: Analysis of Mather Air Force Base Samples

Samples were analyzed by atomic absorption spectrophotometry for arsenic using EPA method 206.2, mercury using EPA method 245.1, and selenium using EPA method 270.2. The sample preparation for arsenic and selenium determinations included concentrating the sample aliquot by a factor of five in order to obtain requested detection limits. The results are presented in Table 1 with QA results in Table 2.

Prepared by

Patrick M Hirata

Chemist

Fruite Approved by:

Greg Nicoll

Manager, Inorganic Chemistry

Hariburtona Mathemolek December on b

Table 1. Analysis Type: Atomic Absorption Metals Has .

Barble Type: Banble ID#:	_AN 201513	LAN Déceil	uAN 00051I	LHN J∂bsl∑	787 200121
long bund		igi			
onsacio. Ha Mentur., Hg Selentur, Se	40 40 40	ם א ם א ס א	ар ем ем	NS MB NO	
Tehestich limit factor:	1,00	1.00	1.00	1.20	
Analysis date:	12/17/85	12/17/36	12/17/95	12-17-85	

MC minor detected at detection limit times factor.

Henrikung Mathemulan December 199

Table 12 Healvais Type: Atomic Absorbtion Medals has in

Bativa Nome: Baccue ID#:		<u>LAN</u> -00-529			
Dimodund		Conce	entration	. 4 =	
Mencun. He Bevenita. Be	NE NS NO	10 10	-	1,5 1,5 1,6 1,6	
Cetection limit factor:	1. 0	1. 9	:. 29	1. 9	
Analysis date:	:2 17 88	12:17 95	12-17 35	12:17 35	

He is union : Machan = FB Lecester :: FBB

- Fable 1. Analysis Type: Atomic Absorption Metals Res 🕟 🦠

Bample Yupe: Bample ID#:	1305II	14N 010577	⊣N 39.∈34	54M 999575	(E) (01111)
laresun:		Conse	entration	ışL	
Ansenio, As Menion, Ag Selenion, Se	· <del>-</del>		-	N.D N.D	
Detection compath ractor:	1.00	1.00	1.00	1.10	
Analysis date:	:2 :7 35	12.17 95	11 17 95	12 17 95	

Mainen --Mainen ---Jedenten ----

Table 1. Analysis Type: Hismid Absonition Mataus Has H

Barole Type: Banole ID#:	uan Abasis	% <b>a N</b> ≪ 3 1 <b>5</b> 1 7	28# 20 878	2 <b>5%</b> 573	19		
u: #352^3	Ishsentration, Jac						
Hersenia, de Mensenia, da Selenian, Se	_	N0 N0 N0	7√2	* ₄ _			
Detection limit Haston:	1.23	1.1.	2,0%	1. 1			
Hralvaia date:	12,17 95	12 17 35	:1 : 35	11 17 85			

No - not setabled at detection limit times factor

Hand promiser Mathem LF: December (44)

Table 1. Analysis Type: Atomic Absorption Metals Hes in

Sandle IS#:	=	LAN 000 <b>641</b>	
lombourd	Co	oncentration	, ug/L
ncsanic, ma Mercury, mg Selesium, Se	ND ND ND	70 ND 70	0.2 2
Datection limit factor:	1.90	1.00	
mnaivais date:	12/17/9a	12/17/36	

Hanton Programme Manten Las Jesemban (1995)

Table 1. Analysis Type: Atomic Absorption Metals 14.

Barola Duca: Barola D <b>a</b> :		<b>୯୬</b> ଟିଆ ଅନ୍ତର			
110111		2002	entration. (	içt	
Hrsetic, Hs Mencir, Tg Selen un. Be	ND NO ND	3M 6M 6M		NO NE NB	
Setaction .imit Haston:	1.00	1.00	<b>1.</b> 6	Y. 30	
analysis datë:	12/17/36	12-17-35	12/17/96	12:17 98	

NO - not betested at detection limit times factor

•

Hensuphor with Mathemodes Jeserben

Table 1. Hoalvais Type: Atomic Absorption Metals :-

ismole Tube: Rampie II#:	UBP 219531	_5F 1-9541	087 29999
lamp synd	Jor	centration.	4 <b>g</b> L
mnaen.i. ma Menium ma Jalani.a. ja	97 % NS 114 .	÷ •	:. <u>2</u> :. <u>2</u>

Tetestion limit factor: ... 1.60

Amalysis date: 12.17 8e - 12.17.36

All - not detected at detection limit times factor

Ná - Wat Estres

% - Parcent spike recovery (As and Se spiked at 100 bg/L). Hg spiked at 10 bg/L:



**Energy & Environmental Division** 

January 23, 1987

AeroVironment, Inc. 825 Myrtle Avenue Monrovia, CA 91016

Attention: Chris Lovdahl

Subject:

Analysis of Mather Air Force Base Samples

Samples were analyzed for metals by EPA method 200.7 using two inductivly-coupled argon plasma spectrometers. Barium was determined on a sequential ICAP unit as the first instrument (a simultaneous ICAP) was not set up for barium. The determination of chromium showed about 20 ug/L of chromium in the samples as well as the method blanks. Therefore the chromium results in the area of 20 ug/L should be regarded with caution. The results are presented in Table 1 with QA results in Table 2.

Inorganic Chemistry

AeroVironment Boll-044 met1144a

Table 1. Analysis Type: 200.7 Metal Results

Sample Type:	LAN	LAN	LAN	LAN	DET
Sample ID#:	000784	000785	000786	000787	999999
Compound		Concer	itration ug/	'L	
Barium, Ba	500	120	84	91	- -
Cadmium, Cd	ND	ND	ND	ND	1
Chromium, Cr	20	13	18	20	-
Lead, Pb	ND	ND	ND	ND	<b>4</b> ()
Silver, Ag	ND	ND	ND	ND	-

Detection limit factor:	1.00	1.00	1.00	1.00
Analysis date (Ba):	01/21/87	01/21/87	01/21/87	01/21/87
Analysis date (Others):	01/20/87	01/20/87	01/20/87	01/20/87

Herovironment 8511-944 met1144b

Table 1. Analysis Type: 200.7 Metal Results

Sample Type: Sample ID#:	LAN 000788	LAN 000789	DET 99999
·			
Compound	Co:	ncentration	ug/L
Barium, Ba	65	190	2
Cadmium, Ed	ND	ND	4
Chromium, Cr	19	21	7
Lead, Pb	ND	ND	40
Silver, Aq	ND	ND	7

Detection limit factor: 1.00 1.00

Analysis date (Ba): 01/21/87 01/21/87 Analysis date (Others): 01/20/87 01/20/87

Herovironment Boll-U44 met1144c

Table 2. Analysis Type: 200.7 Metal QA

Sample Type:	MB1	LDU	DET
Sample ID#:	999998	000784	999999
Compound	Co	ncentration	ug/L
Bartum, Ba	ND	500	2
Cadmium, Ed	ND	ND	4
Chromium. Cr	20	21	7
Lead, Pb	ND	ND	40
Silver, Ag	ND	ND	7

Detection limit factor: 1.00 1.00

Analysis date (8a): 01/21/87 01/21/87 Analysis date (8thers): 01/20/87 01/20/87

Aerovironment 8611-047 met1147a

Table 1. Analysis Type: 200.7 Metal Results

Sample Type:	LAN	LAN	LAN	LAN	DET
Sample ID#:	000790	000791	000792	000793	999999
Compound		Conce	ntration ug	/L	
Barium, Ba	88	19	150	140	?
Cadmium, Cd	ND	ND	ND	ND	4
Chromium, Cr	18	20	14	18	7
Lead, Pb	ND	ND	ND	ND	<b>4</b> Ú
Silver, Ag	D	ND	ND	ND	7

Detection limit factor:	1.00	1.00	1.00	1.00
Analysis date (Ba):	01/21/87	01/21/87	01/21/87	01/21/87
Analysis date (Others):	01/20/87	01/20/87	01/20/87	01/20/87

Aerovironment 8611-047 met1147b

Table 1. Analysis Type: 200.7 Metal Results

Sample Type:	LAN	LAN	DET
Sample ID#:	000794	0007 <b>95</b>	999999
Compound	Col	ncentration	ug/L
Barium, Ba	7.4	87	2
Cadmium, Cd	ND	ND	4
Chromium, Cr	21	36	7
Lead, Pb	ND	N D	<b>4</b> 0
Silver, Ag	ND	N D	7

Detection limit factor: 1.00 1.00

Analysis date (Ba): 01/21/87 01/21/87 Analysis date (Others): 01/20/87 01/20/87

Herovironment Sall-047 met1147c

Table 2. Analysis Type: 200.7 Metal QA

Sample Type: Sample ID#:	MB1 999998	LDU 0007 <b>94</b>	DET 999999
Compound	Co	ncentration	ug/L
Barium, Ba	ND	72	2
Cadmium, Cd	ND	ND	4
Chromium. Cr	21	39	7
Lead, Pb	ND	ND	40
Silver, Ag	ND	ND	7

Detection limit factor: 1.00 1.00

Analysis date (Ba): 01/21/87 01/21/87 Analysis date (Others): 01/20/87 01/20/87

Herovironsent 8611-050 met1150a

Table 1. Analysis Type: 200.7 Metal Results

Sample Type: Sample ID#:	LAN 000796	LAN 000797	LAN 000798	LAN 000799	DET 99999
Campound	Concentration ug/L				
Barium, Ba	120	43	110	53	:
Cadmium, Cd	ND	ND	ND	ND	4
Chromium, Cr	22	21	21	1 7	7
Lead, Pb	ND	ND	ND	ND	<b>4</b> Q
Silver, Ag	ND	ND	ND	ND	7

Detection limit factor:	1.00	1.00	1.00	1.00
Analysis date (Ba):	01/21/87	01/21/87	01/21/87	01/21/87
Analysis date (Others):	01/20/87	01/20/87	01/20/87	01/20/87

Aerovironment Boll-050 met1150b

Table 1. Analysis Type: 200.7 Metal Results

Sample Type: Sample ID#:	LAN 000800	LAN 000801	DET 999999		
Compound	Concentration ug/L				
Barium, Ba	68	20	2		
Cadmium, Cd	ND	ND	4		
Chromium, Cr	20	23	7		
Lead, Pb	ND	ND	40		
Silver, Ag	ND	ND	7		

Detection limit factor: 1.00 1.00

Analysis date (Ba): 01/21/87 01/21/87 Analysis date (Others): 01/20/87 01/20/87

Aerovironment 8611-059 met1159c

Table 2. Analysis Type: 200.7 Metal WA

Sample Type: Sample ID#:	MB1 999998	LSP 000799	DET 999999	
Compound	Concentration ug/L			
Barium, Ba	ND	96 %	_	
Cadmium, Cd	ND	96 %	. 4	
Chromium, Cr	22	99 %	. 7	
Lead, Pb	ND	95 %	40	
Silver, Ag	ND	62 %	, 7	

Detection limit factor: 1.00 1.00

Analysis date (Ba): 01/21/87 01/21/87 Analysis date (Others): 01/20/87 01/20/87

ND - not detected at detection limit times factor % - percent spike recovery (spiked at 2000 ug/L)

Reformant 8512-015 met1215a

Table 1. Analysis Type: 200.7 Metal Results

Sample Type: Sample ID#:	LAN 000610	LAN 000611	LAN 000512	000613	DET 999999
Compound	~~~~~~	Concer	tration ug.	/I	+
Barium, Ba	100	38	54	32	
Cadmium, Cd	ND	ND	ND	ND	4
Chromium. Cr	20	20	21	19	-
cead. Pb	ND	ND	ND	ND	1.
Silver, Aq	ND	ND	ND	ND	-

Detection limit factor:	1.00	1.00	1.00	1.00
Analysis date (Ba):	01/21/87	01/21/87	01/21/87	01/21/87
Analysis date (Others):	01/20/87	01/20/87	01/20/87	01/20/87

Aerovinonment 8612-015 met1215b

Table 1. Analysis Type: 200.7 Metal Results

Sample Type:	LAN	DET	
Sample ID#:	000614	999999	
Campound	Concentration ug/L		
Barium, Ba	63	2	
Cadmium, Cd	ND	4	
Chromium, Cr	14	7	
Lead, Pb	ND	40	
Silver, Ag	ND	7	

Detection limit factor: 1.00

Analysis date (Ba): 01/21/87 Analysis date (Others): 01/20/87

Aerovironment 8al2-915 met1215c

Table 2. Analysis Type: 200.7 Metal QA

Sample Type: Sample ID#:	MB1 999998	DET 99999	
Compound	Concentration ug/L		
Barium. Ba	ND	2	
Cadmium, Ed	ND	4	
Chromium, Cr	20	7	
Lead, Pb	ND	<b>4</b> 0	
Silver, Ag	ND	7	

Detection limit factor: 1.00

Analysis date (Ba): 01/21/87 Analysis date (Others): 01/20/87

Herbylronment 8612-020 met122/a

Table 1. Analysis Type: 200.7 Metal Results

Sample Type: Sample ID#:	LAN 000629	LAN 000630	LAN 000631	LAN 000632	DET 999999
Compound	Concentration ug/L				
Barium, Ba	44	100	220	51	
Cadmium, Cd	ND	ND	ND	ND	4
Chromium, Cr	20	19	20	19	7
Lead, Pb	ND	ND	ND	ND	40
Silver, Ag	ND	ND	ND	ND	7

Detection limit factor:	1.00	1.00	1.00	1.00
Analysis date (Ba):	01/21/87	01/21/87	01/21/87	01/21/87
Analysis date (Others):	01/21/87	01/21/87	01/21/87	01/21/87

Herolinonment Ball-010 met1220b

Table 1. Analysis Type: 200.7 Metal Results

Sample Type: Sample ID#:	LAN 000633	LAN 000634	LAN 000635	LAN 000636	DET 999999	
Compound	Concentration ug/L					
Barium, Ba	27	46	38	10		
Cadmium, Cd	ND	ND	ND	ND	4	
Chromium, Cr	20	20	19	20	7	
Lead, Pb	ND	ND	ND	ND	40	
Silver, Ag	ND	ND	ND	ND	7	

Detection limit factor:	1.00	1.00	1.00	1.00
Analysis date (8a):	01/21/87	01/21/87	01/21/87	01/21/97
Analysis date (Others):	01/21/87	01/21/87	01/21/87	01/21/87

Aerovironment 8612-020 met1220c

Table 1. Analysis Type: 200.7 Metal Results

Sample Type:	LAN	LAN	DET			
Sample ID#:	000637	000628	999999			
Compound	Ca	Concentration ug/L				
Barium, Ba	99	130	2			
Cadmium, Ed	ND	ND	4			
Chromium, Cr	20	20	7			
Lead, Pb	ND	ND	40			
Silver, Ag	ND	ND	7			

Detection limit factor: 1.00 1.00

Analysis date (Ba): 01/21/87 01/21/87 Analysis date (Others): 01/21/87 01/21/87

Aerovironaent 8612-929 met1229d

Table 2. Analysis Type: 200.7 Metal QA

Sample Type:	MB1	LDU	DET
Sample ID#:	999998	000633	999999
Compound	Co	ncentration	ug/L
Sarium, Ba	ND	29	2
Cadmium, Cd	ND	ND	4
Chromium, Cr	20	20	7
Lead, Pb	ND	ND	4 Ü
Silver, Ag	ND	ND	7

Detection limit factor: 1.00 1.00

Analysis date (Ba): 01/21/87 01/21/87 Analysis date (Others): 01/21/87 01/21/87

Aerovironment 8612-922 met1222a

Table 1. Analysis Type: 200.7 Metal Results

Sample Type: Sample ID#;	LAN 000539	LAN 000540	LAN 000641	DET 999 <b>9</b> 99		
Compound	Concentration ug/L					
Barium, Ba Cadmium, Cd Chromium, Cr Lead, Pb Silver, Ag	200 ND 15 ND ND	220 ND 16 ND	100 ND 13 ND	2 4 7 40 7		

Detection limit factor: 1.00 1.00 1.00

Analysis date (Ba): 01/21/87 01/21/87 01/21/87
Analysis date (Others): 01/21/87 01/21/87

Aerovirontant 8612-922 met12225

Table 2. Analysis Type: 200.7 Metal QA

Sample Type: Sample ID#:	MB1 999998	LDU 000640	LSP 000641	DET 999999
Compound		Concentra	tion ug/L	
6 6				
Barıum, Ba	ND	230	95 %	2
Cadmium, Ed	ND	ND	98 %	4
Chromium, Cr	15	13	99 %	7
Lead, Pb	ПN	ND	96 %	4 Ú
Silver, Aq	ND	ND	66 %	7

Detection limit factor: 1.00 1.00 1.00 1.00

Analysis date (Ba): 01/21/87 01/21/87 01/21/87 Analysis date (Others): 01/21/87 01/21/87 01/21/87

ND - not detected at detection limit times factor % - percent spike recovery (spiked at 2000 ug/L)



Energy & Environmental Division

January 23, 1987

AeroVironment, Inc. 825 Myrtle Avenue Monrovia, CA 91016

Attention: Chris Lovdahl

Subject: Analysis of Mather Air Force Base Samples

Samples were analyzed for minerals by EPA method 200.7 using an inductivly-coupled argon plasma spectrometer. Potassium was determined by atomic absorption spectrometry in order to meet the desired detection limit. The detection limit for potassium is the AA detection limits which is lower than the ICAP method detection limit. The results are presented in Table 1 with OA results in Table 2.

Submitted by:

Patrick M. Hirata

Chemist

Greg Nicoll

Manager, Inorganic Chemistry

Aerovironment 8611-030 min1130a

Table 1. Analysis Type: 200.7 Mineral Results

Sample Type: Sample ID#:	LAN 000751	LAN 000752	LAN 000753	LAN 000754	DET 999999
Compound	Concentration mg/L				
Calcium, Ca	8.3	11	7.2	7.8	0.71
Iron, Fe	0.037	0.074	0.3	0.11	ა.აბ7
Magnesium, Mg	4.4	4.7	3.1	3.1	0.03
Manganese, Mn	0.06	0.008	ND	ND	J. 002
Potassium, k (by AA)	1.7	2.5	4.4	2.6	0.01
Sodium, Na	11	19	17	1 4	u. 03

Detection limit factor:	1.00	1.00	1.00	1.00
Analysis date (ICP): Analysis date (K):		01/20/87 01/19/87		01/20/87 01/19/87

Aerovironment 8611-030 min1130b

Table 1. Analysis Type: 200.7 Mineral Results

Sample Type: Sample ID#:	LAN 000755	LAN 000756	LAN 000757	LAN 000758	DET 999999
Campound	Concentration mg/L				
Calcium, Ca Iron, Fe Magnesium, Mg Manganese, Mn Potassium, K (by AA) Sodium, Na	5.7 0.043 1.1 ND 3.7	8.5 0.05 4.5 0.022 1.9	4.6 0.15 1.2 ND 2.3	6.2 2.2 2.1 0.58 0.8 9.7	0.01 0.007 0.03 0.002 0.01 0.03

Detection limit factor:	1.00	1.00	1.00	1.00
Analysis date (ICP):	01/20/87	01/20/87	01/20/87	01/20/87
Analysis date (K):	01/19/87	01/19/87	01/19/87	01/19/87

Aerovironment Boll-039 min1130c

Table 2. Analysis Type: 200.7 Mineral QA

Sample Type:	MB1	DET
Sample ID#:	999998	99999
Compound	Concentration	ag/L
Calcium, Ca	0.06	0.01
Iron, Fe	0.022	0.007
Magnesium, Mg	ND	0.03
Manganese, Mn	ND	0.002
Potassium, K (by AA)	ND	0.01
Sodium, Na	0.09	0.03

Detection limit factor: 1.00

Analysis date (ICP): 01/20/87 Analysis date (K): 01/19/87

AeroVironment 8611-017 min1137a

Table 1. Analysis Type: 200.7 Mineral Results

Sample Type: Sample ID#:	LAN 000759	LAN 000760	LAN 000761	LAN 000762	DET 999999
Compound		Conce	ntration mg	/L	
Calcium, Ca	4.9	8.7	16	16	0.01
Iron, Fe	0.024	0.036	0.032	0.036	0.007
Magnesium, Mg	1.6	3.1	5.4	5.4	0.03
Manganese, Mn	ND	ND	0.003	0.005	0.002
Potassium, K (by AA)	2.3	2	1.1	1.2	0.01
Sodium, Na	46	1 4	8.6	9.1	0.03

Detection limit factor:	1.00	1.00	1.00	1.00
Analysis date (ICP):	01/20/87	01/20/87	01/20/87	01/20/87
Analysis date (K):	01/19/87	01/19/87	01/19/87	01/19/87

AeraVironment 8611-037 min1137b

Table 1. Analysis Type: 200.7 Mineral Results

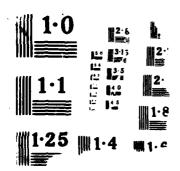
Sample Type:	LAN LAN		DET
Sample ID#:	000763 000764		99999
Compound	Con	centration	mg/L
Calcium, Ca Iron, Fe	7.3 0.19	12	0.01
Magnesium, Mg	3. <b>4</b>	5.4	0.03
Manganese, Mn	0.11	0.15	0.002
Potassium, K (by AA)	1.4	1.9	0.01
Sodium, Na		47	0.03

Detection limit factor: 1.00 1.00

Analysis date (ICP): 01/20/87 01/20/87 Analysis date (K): 01/19/87 01/19/87

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AeroVironment 8611-037 min1137c

Table 2. Analysis Type: 200.7 Mineral QA

Sample Type:	LAN	LDU	DET
Sample ID#:	999998	000759	999999
Compound	Со	ncentration	mg/L
Calcium, Ca	0.11	5.1	0.01
Iron, Fe	0.01	0.03	0.007
Magnesium, Mg	ND	1.7	0.03
Manganese, Mn	ND	ND	0.002
Potassium, K (by AA)	ND	2.4	0.01
Sodium, Na	0.07	46	0.03

Detection limit factor: 1.00 1.00

Analysis date (ICP): 01/20/87 01/20/87 Analysis date (K): 01/19/87 01/19/87

AeroVironment 8611-040 min1140a

Table 1. Analysis Type: 200.7 Mineral Results

Sample Type:	LAN	LAN	LAN	LAN	DET	
Sample ID#:	000765	000766	000767	000768	999999	
Compound	Concentration mg/L					
Calcium, Ca	11	16	8.9	18	0.01	
Iron, Fe	0.31	0.031	0.28	0.072	0.007	
Magnesium, Mg	2.2	2.5	5.3	8.8	0.03	
Manganese, Mn	ND	ND	0.12	0.1	0.002	
Potassium, K (by AA)	1.4	2.2	1.6	1.2	0.01	
Sodium. Na	12	12	16	10	0.03	

Detection limit factor:	1.00	1.00	1.00	1.00
Analysis date (ICP):	01/20/87	01/20/87		01/20/87
Analysis date (K):	01/19/87	01/19/87		01/19/87

Aerovironment 8611-040 min1140b

Table 1. Analysis Type: 200.7 Mineral Results

Sample Type: Sample ID#:	LAN 000769	LAN 000770	DET 99999
Semple 10w.			
Compound	Co	ncentration	mg/L
Calcium, Ca	14	1 4	0.01
Iron, Fe	0.28	0.035	0.007
Magnesium, Mg	0.46	0.45	0.03
Manganese, Mn	ND	ND	0.002
Potassium, K (by AA)	2.5	2.7	0.01
Sodium, Na	24	24	0.03

Detection limit factor: 1.00 1.00

Analysis date (ICP): 01/20/87 01/20/87 Analysis date (K): 01/19/87 01/19/87

Aerovironment 8611-040 min1140c

Table 2. Analysis Type: 200.7 Mineral QA

Sample Type: Sample ID#:	MB1 999998	LDU 000766	LSP 000767		DET 999999
Sample 100:	777770	200788			77777
Compound	Co	ncentration	mg/L		
Calcium, Ca	0.12	16	120	7.	0.01
Iron, Fe	0.01	0.024	94	γ,	0.007
Magnesium, Mg	ND	2.5	92	%	0.03
Manganese, Mn	ND	ND	100	%	0.002
Potassium, K (by AA)	ND	2.2	94	%	0.01
Sodium, Na	0.16	13	100	γ,	0.03

Detection limit factor:	1.00	1.00	1.00
Analysis date (ICP):	01/20/87	01/20/87	01/20/87
Analysis date (K):	01/19/87	01/19/87	01/19/87

ND - not detected at detection limit times factor  $\chi$  - percent spike recovery (spiked at 2 mg/L for Fe and Mn, at 5 mg/L for the rest)

AeroVironment 8611-043 min1143a

Table 1. Analysis Type: 200.7 Mineral Results

Sample Type: Sample ID#:	LAN 000771	LAN 000772	LAN 000773	LAN 000774	DET 999999
Compound		Conce	ntration mg	/L	*
Calcium, Ca	15	0.18	25	7.8	0.01
Iron, Fe	0.062	0.032	0.089	0.042	0.007
Magnesium, Mg	7.4	0.048	13	2	0.03
Manganese, Mn	0.04	ND	0.086	0.011	0.002
Potassium, K (by AA)	1.4	ND	1.6	5	0.01
Sodium, Na	10	0.76	13	31	0.03

Detection limit factor:	1.00	1.00	1.00	1.00
Analysis date (ICP):	01/20/87	01/20/87	01/20/87	01/20/87
Analysis date (K):	01/19/87	01/19/87	01/19/87	01/19/87

AeroVironment 8611-043 min1143b

Table 1. Analysis Type: 200.7 Mineral Results

Sample Type:	LAN	LAN	LAN	DET		
Sample ID#:	000775	000776	000777	999999		
Compound	Concentration mg/L					
Calcium, Ca Iron, Fe	2.1	13	12	0.01		
Magnesium. Mg	0.15	6.5	1.6	0.03		
Manganese, Mn	ND	0.05	ND	0.002		
Potassium, K (by AA)	3. <i>7</i>	0.96	4.3	0.01		
Sodium, Na	33	9	41	0.03		

Detection limit factor: 1.00 1.00 1.00

Analysis date (ICP): 01/20/87 01/20/87 01/20/87 Analysis date (K): 01/19/87 01/19/87 01/19/87

Aerovironment 8611-043 min1143c

Table 2. Analysis Type: 200.7 Mineral QA

Sample Type: Sample ID#:	MB1 999998	LDU 000777	DET 99 <b>9</b> 999		
Compound	Concen	tration mg/	 /L		
Calcium, Ca	0.12	13	0.01		
Iron, Fe	0.015	0.062	0.007		
Magnesium, Mg	ND	1.6	0.03		
Manganese, Mn	ND	0.01	0.002		
Potassium, K (by AA)	ND	4.4	0.01		
Sodium, Na	0.12	41	0.03		

Detection limit factor: 1.00 1.00

Analysis date (ICP): 01/20/87 01/20/87 Analysis date (K): 01/19/87 01/19/87

Aerovironment 8611-044 min1144a

Table 1. Analysis Type: 200.7 Mineral Results

Sample Type: Sample ID#:	LAN 00077 <b>8</b>	LAN 000779	LAN 000780	LAN 000781	DET 9 <b>999</b> 99	
Compound	Concentration mg/L					
Calcium, Ca	11	8.7	9.1	4.7	0.01	
Iron, Fe	0.032	0.017	0.045	0.022	0.007	
Magnesium, Mg	6.1	3.4	4.3	0.24	0.03	
Manganese, Mn	0.05	ND	0.006	ND	0.002	
Potassium, K (by AA)	1.4	1.8	1.4	3.4	0.01	
Sodium, Na	9.3	17	12	3 <b>5</b>	0.03	

Detection limit factor:	1.00	1.00	1.00	1.00
Analysis date (ICP):	01/20/87	01/20/87	01/20/87	01/20/87
Analysis date (K):	01/19/87	01/19/87	01/19/87	01/19/87

Aerovironment 8611-944 min1144b

Table 1. Analysis Type: 200.7 Mineral Results

Sample Type: Sample ID#:	LAN 000783	LAN 000784	LAN 000785	LAN 000786	DET 999999
Compound	Concentration mg/L				
Calcium, Ca	9.6	46	31	5.4	0.01
Iron, Fe	0.035	1.4	Ů. Ů <b>8</b>	0.032	0.007
Magnesium, Mg	1.5	22	15	0.37	0.03
Manganese, Mn	DM	0.55	0.18	ND	0.002
Potassium, K (by AA)	3 <b>.5</b>	2.1	1.7	3.1	0.01
Sodium. Na	15	19	15	29	0.03

Detection limit factor:	1.00	1.00	1.00	1.00
Analysis date (ICP):	01/20/87	01/20/87	01/20/87	01/20/87
Analysis date (K):	01/19/87	01/19/87	01/19/87	01/19/87

Aeraviranment 8611-044 min1144c

Table 1. Analysis Type: 200.7 Mineral Results

Sample Type: Sample ID#:	LAN 000787	LAN 000788	LA <b>n</b> 000789	DET 999 <b>999</b>
Jampie 10 III				
Campound		Concentrat	tion mg/L	
Calcium, Ca	25	6.9	100	0.01
Iron, Fe	0.11	0.016	1.5	0.007
Magnesium, Mg	14	1.7	53	0.03
Manganese, Mn	0.098	ND	0.14	0.002
Potassium, K (by AA)	1.9	4.1	2	0.01
Sodium, Na	18	34	28	0.03

Detection limit factor:	1.00	1.00	1.00
Analysis date (ICP):	01/20/87	01/20/87	01/20/87
Analysis date (K):	01/19/87	01/19/87	01/19/87

Aerovironment 8611-044 min1144d

Table 2. Analysis Type: 200.7 Mineral QA

Sample Type: Sample ID#:	MB1 999998	LDU 000784	LSP 0007 <b>85</b>	DET 999999
Compound				
Caicium, Ca	0.07	45	150 %	0.01
Iron, Fe	ND	1.4	100 %	
Magnesium, Mg	ND	22	94 %	0.03
Manganese, Mn	ND	0.54	100 %	0.002
Potassium, K (by AA)	ND	2.1	92 %	0.01
Sodium, Na	ND	19	120 %	0.03

Detection limit factor: 1.00 1.00 1.00 1.00 Analysis date (ICP): 01/20/87 01/20/87 01/19/87 01/19/87 01/19/87

ND ~ not detected at detection limit times factor % - percent spike recovery (spiked at 2.0 mg/L Fe and Mn, at 5.0 mg/L for the rest)

Aerovironnent 3611-047 min:1147a

Table 1. Analysis Type: 200.7 Mineral Results

Sample Type:	LAN	LAN	LAN	LAN	DET	
Sample ID#:	000790	000791	000792	000793	79999	
Compound	Concentration mg/L					
Calcium, Ca	5.5	5.5	120	7.4	0.61	
Iron, Fe	0.057	0.034	5.1	3.7	0.307	
Magnesium, Mg	1.8	1.8	65	33	0.35	
Manganese, Mn	ND	ND	0.17	0.26	0.002	
Potassium, k (by AA)	5.1	5.2	2.7	2.1	0.01	
Sodium, Na	19	18	2 <b>9</b>	24	0.03	

Detection limit factor:	1.00	1.00	1.00	1.00
Analysis date (ICP): Analysis date (K):			01/20/87 01/19/87	

AeroVironment 8511-047 min11475

Table 1. Analysis Type: 200.7 Mineral Results

Sample Type: Sample ID#:	LAN 000794	LAN 000795	DET 999999
Compound	Co	ncentration	mg/L
Calcium, Ca Iron, Fe	19 0.063	8.9 0.16 3.9	0.01 0.007 0.03
Magnesium, Mg Manganese, Mn Potassium, K (by AA) Sødium, Na	2.5 ND 2.7 15	0.017 0.85 8.7	0.002 0.01 0.03

Detection limit factor: 1.00 1.00

Analysis date (ICP): 01/20/87 01/20/87 Analysis date (K): 01/19/87 01/19/87

Aerovironment 8611-047 min1147c

Table 2. Analysis Type: 200.7 Mineral QA

Sample Type: Sample ID#:	MB1 999998	LDU 000794	DET 999999
Compound	Co	ncentration	mg/L
Calcium, Ca	0.14	19	0.01
Iron, Fe	ND	0.041	0.007
Magnesium, Mg	0.04	2.2	0.03
Manganese, Mn	ND	ND	0.002
Potassium, K (by AA)	ND	2.5	0.01
Sodium, Na	0.06	15	0.03

Detection limit factor: 1.00 1.00

Analysis date (ICP): 01/20/87 01/20/87 Analysis date (K): 01/19/87 01/19/87

AeroVironment 8611-050 min1150a

Table 1. Analysis Type: 200.7 Mineral Results

Sample Type: Sample ID#:	LAN 000796	LAN 000797	LAN 000798	LAN 000799	DET 999999
Campound		Conce	ntration mg	/L	
Calcium, Ca	44	75	37	37	0.01
Iron, Fe	0.76	0.026	0.32	0.29	0.007
Magnesium, Mg	25	0.14	17	17	0.03
Manganese, Mn	0.61	ND	0.13	0.13	0.002
Potassium, K (by AA)	3	3.7	1.6	1.4	0.01
Sodium, Na	56	59	15	16	0.03

Detection limit factor:	1.00	1.00	1.00	1.00
Analysis date (ICP):	01/20/87	01/20/87	01/20/87	01/20/87
Analysis date (K):	01/19/87	01/19/87	01/19/87	01/19/87

Aerovironment 8511-050 min1150b

Table 1. Analysis Type: 200.7 Mineral Results

Sample Type:	LAN	LAN	DET
Sample ID#:	00800	000801	999999
Compound	Co	ncentration	ag/L
Calcium, Ca Iron, Fe	23 0.028	0.6	0.01
Magnesium, Mg	0.16	0.13	0.03
Manganese, Mn	ND	ND	0.002
Potassium, K (by AA)	2.9	0.04	0.01
Sodium, Na	45	0.5	0.03

Detection limit factor: 1.00 1.00

Analysis date (ICP): 01/20/87 01/20/87 Analysis date (K): 01/19/87 01/19/87

Aerovironment 8611-050 min1150c

Table 2. Analysis Type: 200.7 Mineral QA

Sample Type: Sample IO#:	MB1 999998	LSP 000799	_	DET 999999
Compound	Cor	ncentratio	n (	g/L
Calcium, Ca Iron, Fe	0.13 0.015 ND	110 99 73	%	0.01 0.007 0.03
Magnesium, Mg Manganese, Mn Potassium, K (by AA) Sodium, Na	ND 0.02 0.17	98 92 77	% %	0.002 0.01 0.03

Detection limit factor: 1.00 1.00

Analysis date (ICP): 01/20/87 01/20/87 Analysis date (K): 01/19/87 01/19/87

ND - not detected at detection limit times factor
% - percent spike recovery (spiked at 2.0 mg/L for Fe and Mn, at 5.0 mg/L for the rest

Aerovironmenn Boll-914 min1214a

Table 1. Analysis Type: 200.7 Mineral Results

Sample Type: Sample ID#:	LAN 000601	LAN 000602	000603	LAN 000604	DET 99999
Campound		Conce	ntration mg	/L	••••
Calcium, Ca	8.9	9.7	1.4	18	0.11
Iron, Fe	0.024	0.018	0.044	0.099	9.107
Magnesium, Mg	5.3	0.27	7.7	9.4	9.93
Manganese, Mn	0.12	ND	0.007	0.091	0.002
Potassium, K (by AA)	1.7	3.4	1.7	1.3	0.51
Sodium, Na	14	16	11	11	0.03

Detection limit factor:	1.00	1.00	1.00	1.00
Analysis date (ICP):	01/20/87	01/20/87	01/20/87	01/20/87
Analysis date (K):	01/19/87	01/19/87	01/19/87	01/19/87

AeroVironment 8612-014 min1214b

Table 2. Analysis Type: 200.7 Mineral DA

Sample Type: Sample ID#:	MB1 999998	DET 999999
Compound	Concentratio	n mg/L
Calcium, Ca	0.1	0.01
Iron, Fe Magnesium, Mg	ND ND	0.03
Manganese, Mn Potassium, K (by AA) Sodium, Na	ND ND	0.01

Detection limit factor: 1.00

Analysis date (ICP): 01/20/87 Analysis date (K): 01/19/87

Aerovironment Boll-715 Win1215a

Table 1. Analysis Type: 200.7 Mineral Results

Sample Type: Sample ID#:	LAN 00060 <b>5</b>	LAN 000506	LAN 000607	EAN 000608	DET 999999
Compound	Concentration mg/L				
Calcium, Ca	7.5	12	21	20	3, .1
Iron, Fe	0.066	0.032	Ü.14	0.14	v.Je?
Magnesium, Mg	0.33	1.1	11	11	0.01
Manganese, Mn	ND	ND	0.062	0.061	0.061
Potassium, k (by AA)	3	3.7	1.6	1.4	0.51
Sodium, Na	21	26	12	13	Ů.⊅J

Detection limit factor:	1.00	1.00	1.00	1.00
Analysis date (ICP):	01/20/87	01/20/87	01/20/87	01/20/87
Analysis date (K):	01/19/87	01/19/87	01/19/87	01/19/87

Hero.ironment 3612-015 min1215b

Table 1. Analysis Type: 200.7 Mineral Results

Sample Type: Sample IO#:	LAN 000 <b>609</b>	LAN 000610	LAN 000611	LAN 000512	DET 999999
Compound		Conce	ntration mg	/L	
Calcium. Ca	9.8	37 0.057	5.5 0.033	8.5	0.01
Iron, Fe Magnesium, Mg	0.016	16	1.1	3.5	0.00
Manganese, Mn Potassium, k (by AA)	0.003 4.2	0.03 <b>3</b> 2	ND 3.2	ND 1.8	0.002 0.01
Sodium, Na	22	15	17	9.2	0.00

Detection limit factor:	1.00	1.00	1.00	1.00
Analysis date (ICP):	01/20/87	01/20/87	01/20/87	01/20/87
Analysis date (K):	01/19/87	01/19/87	01/19/87	01/19/87

Hero/ironment 8612-915 €101215c

Table 1. Analysis Type: 200.7 Mineral Results

Sample Type:	LAN	LAN	DET	
Sample ID#:	000613	000614	999999	
Compound	Concentration mg/L			
8.1			^ ^	
Calcium, Ca	6.3	83	0.01	
Iron, Fe	0.057	1.2	0.007	
Magnesium, Mg	Ú.77	43	0.03	
Manganese, Mn	ND	0.36	0.002	
Potassium, k (by AA)	3.4	2.3	0.01	
Sodium, Na	15	22	0.03	

Detection limit factor: 1.00 1.00

Analysis date (ICP): 01/20/87 01/20/87 Analysis date (K): 01/19/87 01/19/87

Aerovironment Beil2-015 mini215d

Table 2. Analysis Type: 200.7 Mineral QA

Sample Type:	MB1	LDU	DET
Sample ID#:	999998	000607	999999
Compound	Co	ncentration	mg/L
Calcium, Ca	0.13	21	0.01
Iron, Fe	0.012	0.15	0.007
Magnesium, Mg	ND	11	0.03
Manganese, Mn	ND	0.064	0.002
Potassium, K (by AA)	ND	1.6	0.01
Sodium. Na	0.06	1.2	0.03

Detection limit factor: 1.00 1.00

Analysis date (ICP): 01/20/87 01/20/87 Analysis date (K): 01/19/87 01/19/87

Aerovirontent Bol2-915 min1219a

Table 1. Analysis Type: 200.7 Mineral Results

Sample Type: Sample ID#:	LAN 000615	LAN 000615	LAN 000617	LAN 000618	DET 999999
Compound		Conce	ntration mg	/L	
Calcium, Ca	7,7	12	12	3,3	), , ;
Iron, Fe	0.024	0.042	0.078	0.12	J. J. 7
Magnesium, Mg	3.6	6.4	5.4	0.42	9.55
Manganese, Mn	0.026	0.012	0.024	ND	9.002
Potassium, K (by AA)	2	0.76	1.4	3.4	0.01
Sodium, Na	8.9	8.7	8.6	18	

Detection limit factor:	1.00	1.00	1.00	1.00
Analysis date (ICP):	01/21/87	01/21/87	01/21/87	01/21/87
Analysis date (K):	01/19/87	01/19/87	01/19/87	01/19/87

Aerovironment 8612-019 @in1219b

Table 1. Analysis Type: 200.7 Mineral Results

Sample Type: Sample ID#:	LAN 000619	LAN 000620	LAN 000621	LAN 000622	DET 99999
Compound		Conce	ntration mg	/L	
Calcium, Ca	8	3.7	13	7.5	0.01
Iron. Fe	0.26	0.051	0.095	0.02	0.007
Magnesium, Mg	4.4	0.32	6.1	4	0.03
Manganese, Mn	0.11	ND	0.13	ND	9.172
Potassium, k (by AA)	0.76	3.7	2.9	0.97	0.01
Sodium, Na	18	15	9.2	7.4	0.03

Detection limit factor:	1.00	1.00	1.00	1.00
Analysis date (ICP): Analysis date (K):	<del>-</del>		01/21/87 01/19/87	

Aero.irontent B612-919 B1012195

Table 1. Analysis Type: 200.7 Mineral Results

Sample Type: Sample ID#:	LAN 000623	LAN 000524	LAN 000625	LAN 000625	DET 99999	
Compound	Concentration mg/L					
Calcium, Ca	11	20	8.6	12		
Iran, Fe	0.11	0.35	Ú.Ú18	0.052	•	
Magnesium, Mg	5.1	9.8	3.9	4.9		
Manganese, Mn	v.11	0.16	ND	0.081	3. 2. <u>2</u>	
Potassium. K (by AA)	1.7	3.8	1.9	3		
Sodium, Na	15	11	5.8	13	03	

Detection limit factor:	1.00	1.00	1.00	1.00
Analysis date (ICP):	01/21/87	01/21/87	01/21/87	01/21/87
Analysis date (K):	01/19/97	01/19/97	01/19/87	01/19/87

Aero,ironment 3612-019 @in1219d

Table 1. Analysis Type: 200.7 Mineral Results

Sample Type:	LAN	LAN	DET
Sample ID#:	000627	000628	99999
Compound	Co	ncentration	mg/L
Calcium, Ca	12	18	0.01
Iron, Fe	0.086	0.3	0.007
Magnesium, Mg	5.8	9.4	0.03
Manganese, Mn	0.12	0.25	0.002
Potassium, K (by AA)	2.3	3.4	0.01
Sodium, Na	10	11	

Detection limit factor: 1.00 1.00

Analysis date (ICP): 01/21/87 01/21/87 Analysis date (K): 01/19/87 01/19/87

Aerovironment 8512-019 min1219e

Table 2. Analysis Type: 200.7 Mineral QA

Sample Type: Sample ID#:	MB1 999998	LDU 000618	LSP 000621	DET 999999
Compound	Co			
Calcium. Ca	0.08	3.4	110 %	0.01
Iron, Fe	0.012	0.15	110 %	0.007
Magnesium, Mg	ND	0.43	100 %	0.03
Manganese, Mn	ND	ND	110 %	0.002
Potassium, K (by AA)	ND	3.5	97 %	0.01
Sodium. Na	ND	19	110 %	0.03

Detection limit factor:	1.00	1.00	1.00
Analysis date (ICP):	01/21/87	01/21/87	01/21/87
Analysis date (K):	01/19/87	01/19/87	01/19/87

ND - not detected at detection limit times factor % - percent spike recovery (spiked at 2.0 mg/L Fe and Mn. at 5.0 mg/L for the rest)

Aerovironment 8612-020 min1220m

Table 1. Analysis Type: 200.7 Mineral Results

Sample Type:	LAN	000630	LAN	LAN	DET
Sample ID#:	000629		000631	000632	9 <b>999</b> 99
Compound		Conce	itration mg.	/ L	
Calcium, Ca Iron, Fe Magnesium, Hg Manganese, Hn Potassium, K (by AA)	8.7	8.2	120	44	0.01
	0.023	0.015	9.4	1.5	07
	3.1	2.9	51	24	03
	ND	ND	0.18	0.37	0.002
	3	2.7	2	4.1	0.01
Sodium, Na	19	19	29	31	0.03

Detection limit factor:	1.00	1.00	1.00	1.90
Analysis date (ICP):	01/21/87	01/21/87	01/21/87	01/21/87
Analysis date (K):	01/19/87	01/19/87	01/19/87	01/19/87

AeroVironment 8612-020 min122/b

Table 1. Analysis Type: 200.7 Mineral Results

Sample Type: Sample ID#:	000633	LAN 000634	LAN 000635	LAN 000636	DET 999999	
Compound	Concentration mg/L					
Calcium. Ca	13	20	10	0.29	0.01	
Iron, Fe	0.05	0.074	0.017	0.018	0.007	
Magnesium, Mg	0.25	9.2	0.08	0.05	0.00	
Manganese, Mn	ND	0.047	ND	ND	0.062	
Potassium, k (by AA)	3.5	1.3	3.1	0.02	0.01	
Sodium, Na	27	11	25	0.69	0.00	

Detection limit factor:	1.00	1.00	1.00	1.00
Analysis date (ICP):	01/21/87	01/21/87	01/21/87	01/21/87
Analysis date (k):	01/19/87	01/19/87	01/19/87	01/19/87

Aerovironment 8612-020 mini200c

Table 1. Analysis Type: 200.7 Mineral Results

Sample Type: Sample ID#:	LAN 000637	LAN 000638	DET 999999
Compound	Co	ncentration	mg/L
Calcium, Ca	140	5.1	0.01
Iron, Fe	6.3	0.17	0.007
Magnesium, Mg	58	1.8	0.03
Manganese, Mn	0.19	ND	0.002
Potassium, K (by AA)	2.4	4.2	0.01
Sodium. Na	28	15	0.03

Detection limit factor: 1.00 1.00

Analysis date (ICP): 01/21/87 01/21/87 Analysis date (K): 01/19/87 01/19/87

Herovinonagen Ballowl Winill.d

Table 2. Analysis Type: 200.7 Mineral QA

Sample Type: Sample ID#:	99999B	000 <b>92</b> 2	LSP 000634	DET 999999
Compound		Concentra	tion mg/L	
Calcium, Ca Iron, Fe	0.17 0.012	0.036	140 %	0.91
Magnesium, Mg Manganese, Mn	ND ND	0.18 ND	110 % 110 %	0.01 0.002
Potassium, k (by AA) Sodium, Na	ND ND	3.7 28	100 % 120 %	0.01 0.03

Detection limit factor:	1.00	1.00	1.00
Analysis date (ICP): Analysis date (K):	01/21/87 01/19/87	01/21/87	01/21/87

ND - not detected at detection limit times factor. % - percent spike recovery (spiked at 2.0 mg/L for Fe and Mn. at 5.0 mg/L for the rest

Aerovironment 9512-922 min1222a

Table 1. Analysis Type: 200.7 Mineral Results

Sample Type: Sample ID#:	LAN 000639	LAN 000640	LAN 000541	LAN 000642	DET 99 <b>9</b> 99
Compound	*******				
Calcium, Ca	68	43	45	9.8	0.01
Iron, Fe	11	0.18	0.17	0.92	0.007
Magnesium, Mg	33	23	24	3.5	0.00
Manganese, Mn	0.21	0.093	0.097	0.005	0.002
Potassium, K (by AA)	1.9	1.7	1.8	2.9	0.01
Sodium, Na	23	18	18	10	0.03

Detection limit factor:	1.00	1.00	1.00	1.00
Analysis date (ICP):	01/21/87	01/21/87	01/21/87	01/21/87
Analysis date (k):	01/19/87	01/19/87	01/19/87	01/19/87

Aerovironment Soll-VII mini2025

Table 1. Analysis Type: 200.7 Mineral Results

Sample Type: Sample ID#:	LAN 000643	LAN 000644	LAN 000645	LAN 000646	DET 999999	
Compound	Concentration mg/L					
Calcium, Ca Iron, Fe	7.3	12	7.7	7.1	0.01 0.03	
Magnesium, Mg Manganese, Mn	2.6 ND	4.7	3.3 ND	2.7 ND	0.13 0.002	
Potassium, k (by AA) Sodium, Na	5.4 20	1.9	2.3	2.1	0.03	

Detection limit factor:	1.00	1.00	1.00	1.00
Analysis date (ICP):	01/21/87	01/21/87	01/21/87	01/21/87
Analysis date (K):	01/19/97	01/19/87	01/19/87	01/19/87

Aerovironment 8612-022 ein1222c

Table 1. Analysis Type: 200.7 Mineral Results

Sample Type: Sample ID#:	LAN 000647	LAN 000648	DET 999999		
Compound	Concentration mg/L				
Calcium, Ca Iron, Fe Magnesium, Mg Manganese, Mn Potassium, k (by AA) Sodium, Na	9.1 0.14 4.1 ND 1 7.6	34 0.35 16 ND 1.6	0.01 0.007 0.03 0.002 0.01 0.03		

 Detection limit factor:
 1.00
 1.00

 Analysis date (ICP):
 01/21/87
 01/21/87

Analysis date (ICP): 01/21/8/ 01/21/8/ Analysis date (K): 01/19/87 01/19/87

Aerolingoment B612-V22 min1222d

Table 2. Analysis Type: 200.7 Mineral QA

Sample Type: Sample ID#:	MB1 999998	LDU 000640	LDU 000648	DET 99999			
Campaund		Concentration mg/L					
Calcium, Ca	0.1	44	33	0.01			
Iron, Fe	0.009	0.18	0.35	0.007			
Magnesium, Mg	ND	23	15	0.03			
Manganese, Mn	ND	0.092	МÐ	0.002			
Potassium, k (by AA)	ND	1.3	1.5	0.01			
Sodium, Na	<b>0.1</b>	18	15	0.03			

Detection limit factor: 1.00 1.00 1.00

Analysis date (ICP): 01/21/87 01/21/87 01/21/87 Analysis date (K): 01/19/87 01/19/87 01/19/87

Aerovironment 8612-923 min1223a

Table 1. Analysis Type: 200.7 Mineral Results

Sample Type: Sample ID#:	LAN 000 <b>649</b>	LAN 000650	LAN 000651	LAN 000 <b>65</b> 2	DET 99999
Campound		Conce	ntration mg	/L	
Calcium, Ca	10	3.4	7.5	7.5	0.01
Iron. Fe	0.035	0.098	0.033	0.17	0.007
Magnesium, Mg	4.3	Ů.7 <b>2</b>	3.5	3.5	0.03
Manganese, Mn	0.009	ND	0.13	0.12	0.002
Potassium, K (by AA)	2.9	4.2	1.5	1.4	ŭ.01
Sodium, Na	12	27	13	14	0.03

Detection limit factor:	1.00	1.00	1.00	1.00
Analysis date (ICP):	01/21/87	01/21/87	01/21/87	01/21/87
Analysis date (K):	01/19/87	01/19/87	01/19/87	01/19/87

Herovironment 8512-023 @in1225b

Table 1. Analysis Type: 200.7 Mineral Results

Sample Type: Sample ID#:	LAN 000653	LAN 000654	LA <b>n</b> 000 <b>655</b>	LAN 000656	0E7 999999	
Compound	Concentration mg/L					
Calcium, Ca	11	10	8	16	0.01	
Iran, Fe	0.018	0.079	<b>0.47</b>	0.22	0.907	
Magnesium. Mg	4.8	2.9	3.1	5.4	0.00	
Manganese, Mn	0.013	ND	ND	ND	0.002	
Potassium. K (by AA)	5.4	1.9	2.3	2.1	0.01	
Sodium, Na	11	11	8.7	9.1	0.03	

Detection limit factor:	1.00	1.00	1.00	1.00
Analysis date (ICP): Analysis date (K):	01/21/87 01/19/87		01/21/87 01/19/87	

HeroVironment 8612-923 #in1223c

Table 1. Analysis Type: 200.7 Mineral Results

Sample Type: Sample ID#:	LAN 000657	LAN 000658	LAN 000659	LA <b>n</b> 000660	DET 999999	
Compound	Concentration mg/L					
Calcium, Ca	7.1	13	14	0.19	0.01	
Iran, Fe	0.062	0.02	0.04	0.022	0.007	
Magnesium, Mg	2.8	5.5	5.5	ND	0.03	
Manganese, Mn	0.003	0.13	0.12	ND	0.002	
Potassium, K (by AA)	3.4	1.7	1.5	ND	0.01	
Sodium. Na	16	30	30	0.75	0.03	

Detection limit factor:	1.00	1.00	1.00	1.00
Analysis date (ICP):	01/21/87	01/21/87	01/21/87	01/21/87
Analysis date (K):	01/19/87	01/19/87	01/19/87	01/19/87

ND - not detected at detection limit times factor

Herovironment 9511- 17 ≇101227d

Table 1. Analysis Type: 200.7 Mineral Results

Sample Type:	LAN	DET
Sample ID#:	000661	99999
Compound	Concentration	 n mg/L
Calcium, Ca	9.8	0.01
fron, Fe	0.16	0.007
Magnesium, Mg	3.4	0.03
Manganese, Mn	0.55	0.002
Potassium, K (by AA)	0.94	0.01
Sodium, Na	9.9	0.03

Detection limit factor: 1.00

Analysis date (ICP): 01/21/87 Analysis date (K): 01/19/87

AeroVironment 8612-923 min1223e

Table 2. Analysis Type: 200.7 Mineral QA

Sample Type: Sample ID#:	MB1 <b>99</b> 9998	LDU 000650	LSP 000 <b>65</b> 6	DET 999999
Compound		Concentra		
Calcium, Ca	0.2	3.4	110 2	0.01
Iron, Fe	0.015	0.06	110 7	0.007
Magnesium, Mg	ND	0.57	90 7	0.03
Manganese, Mn	ND	ND	100 7	0.002
Potassium, K (by AA)	ND	4.2	95 7	0.01
Sodium, Na	0.16	28	96 7	0.03

Detection limit factor: 1.00 1.00 1.00 1.00

Analysis date (ICP): 01/21/87 01/21/87 01/19/87 01/19/87 01/19/87

ND - not detected at detection limit times factor % - percent spike recovery (spiked at 2.0 mg/L for Fe and Mn, at 5.0 mg/L for the rest



Energy & Environmental Division

November 26, 1986

AeroVironment, Inc. 325 Myrtla Avenue Monrovia, CA 91016

Attention: Chris Lovdanl

Subject: Analysis of Mather Air Force Base Samples

Samples were analyzed for bicarbonate, carbonate, and hydroxide alkalinities by Standard Method 403. The results are presented in Table 1 with CA results in Table 1.

Approved by:

Manager, Inorganic Chemistry

Herovinonien Mathem Hall November India

Table 1. Analysis Type: Alvalinity Results

Sample T.pe:	LAN	LAN	LAN	030754	2ET	
Sample ID#:	000751	000752	000753		999922	
Compound	Concentration, mg/L					
Bicarbonate Alv., as CaCOJ	4.7	57	53	4 7	1	
Carbonate Alv., as CaCOJ	ND	ND	ND	NE	4	
Hidroxide Alk., as CaCOJ	ND	ND	ND	NE	2	
mnal.sis date:	11/21/96	11/21/85	11/21/86	11/21/86		

Henry minters Mathem HRS November (FES

Table 1. Analysis Type: Alkalinit, Results

Sample Tupe:	LAN	LAN	LAN	LAN	0E7
Sample ID#:	000755	000756	0007 <b>5</b> 7	000753	903223
Compound	Concentration, mg/L				
Bicarbonate Alk., as CaCOD	3.4	51	79	IS	
Carbonate Alk., as CaCOD	N D	ND	ND	ND	
Hydroxide Alk., as CaCOD	N D	ND	ND	ND	
Analysis date:	11 21/95	11/21/95	11/21/86	11/21/86	

Hero Victorio Manner He November 1995

Table 1. Analysis Type: Alvalinity Pesults

cascia fice: Sample II#:				<u>26₩</u> 2007±I	
Longaund	Concentration, mg L				
Sicarconate Hiv., as IaCOT Carbonate Hiv., as IaCOT Hidroride Alv., as IaCOT	91 NG ND	4 = ND NO	ND	71 95 90	4
Analysis date:	11 21 90	1: 21 85	11, 21, 26	11/21 85	

Heroulogonari Mathem Hag November 1985

Table 1. Analysis Type: Alkalinity Results

Sample (voe:	LAN	LAN	EAN	LAN	3 <u>8</u> 7
Sample (O#:	000753	0007 <b>54</b>	00076 <b>5</b>	390756	999955
longque;	Concentration, mg·L				
Bicarbonate Alv., as CaCOD	ND	120	50	51	-
Larbonate Alv., as CaCOD	ND	ND	4	12	
mydmoxide Alv., as LaCOT	19	ND	ND	ND	
mnal.sis pate:	11/21/86	11 21/86	11/21/56	11/21/86	

Henryun Mathen H² Novesper Unio

fable i. Analysis fype: Alkalinity Resolts

demple Tyder Bample ID#:				0.4N 0.1077	257
8 <i>ರಾಗಾರರ</i> ವಾದ		Concentrat	ion, mg L		
Bicarbonate Alv., as CaCGD Carbonate Hlk., as CaCGD Hydroxide Hlk., as CaCGD	50 ND NO	77 ND ND	59 ND ND	51; 22 No	
moal-sis date:	11 21/35	11-21 35	11/21 86	11.21 86	

Herbuurpinkin Mathemiek November inn

Table 1. Healvsis Type: Hivalinit, Results

Sample Tipe: Sample 10#:	_	_	_	EAN 2012 ⁷⁷ 4	
lompagne		Concentrat	.ion. mg-1		
dicarponate Alk., as CaCOI Carponate Alk., as CaCOI Highoride Alk., as CaCOI	N D N D		179 ND ND	5 c N 0 N 0	
45a./818 1ate:	11 I1 85	11/21 95	11/21/86	11/21/85	

Hent Unitary Marter HFB November Unit

Table 1. Analysis Type: Alkalinity Results

Bampie (Dat	040	LAN	LAN	24N	187
Bampie (D#t	000775	000775	999777	299773	
Ishabuna					
Bicarbonate Alv., as CaCOT	79		50	51	1
Carbonate Alv., as CaCOT	18		42	ND	1
Hudrovide Alv., as CaCOT	ND		ND	ND	2
analysis date:	11-21 95	11 21 80	11:21:35	11/21/86	

Hand Unitrial to Mathem Half November 1985

Table 1. Analysis Tybe: Alkalinity Results

Bample (Ce) Bample (C#)	_			24 <b>%</b> 882 ⁷ 83	
Compound	Concentration, mg c				
Estambonate Alk., as CaCCT Cambonate Alk., as CaCCT Hydro ide Alk., as CaCCT	50 NB ND		: 4 : 5 ND	: 3	:
GSa.vais data:	11 21/86	11/21/96	11-21-86	11-11-95	

Hafilan (n. 1920) Mathan (His November (1935)

Table 1. Analysis Type: Al-alimity Results

Sample Type: Sample 10#:		#M 100785			114111
Compound					
Sicarponate Alk., as IaCOD Langonate Alk., as CaCOD Hidroxide Alk., as CaCOD		170 ND NB	51 6 ND	117 NE NO	-
mnsl.sis date:	11 21 85	11:21/85	11/21/86	11,21,96	

Handuuru ne n Matheriuss November 1988

Table 1. Analysis Type: Alvalinity Results

Bampie de: Bampia 15#:	=	EAN 000789	LAN 0007 <b>9</b> 0	24N 0√0791	3E ⁻ ;;;;;;
โอสธอยา <b>d</b>		Concentrat	ion, mg/L		
Bicarbonate Alv., as CaCOD Carbonate Alv., as CaCOD mydroxide Alv., as CaCOD	49 ND ND	350 ND ND	60 8 ND	5. 3 ND	-
anasia date:	11/21/96	11/21/86	11, 21, 86	11/01.85	

Haristototoeon Mather H^EE November 1⁸⁸

Table 1. Analysis Type: Alvalinity Results

Bample (D#:	= :	LAN 000793	<del>-</del>	LHN 000775	562 202222
Jampagna		Concentrat	ilon, mg/L		
Bicarbonate Alk., as CaCOI Carbonate Alk., as CaCOI Hydroxide Alk., as CaCOI	450 ND ND	319 ND NS	94 22 ND	51 ND ND	; 4 ;
Hnalysis date:	11 21/85	11 21 86	11/21/96	11,21,85	

Hattan 1999 November 1999

Table 1. Analysis Type: Alkalinity Results

Sample (1.de: Sample (1.#:		LAN (∱0797	=	LAN 000799	267 20 <b>2</b> 022	
Compound		Concentration, mg/L				
Bicarbonate Alv., as CaCCT Carbonate Alv., as CaCCT Hydroxide Alk., as CaCCT	55 ND ND	240 ND ND	150 ND ND	150 NO NO	: :	
Analysis date:	11 21 86	11/21/86	11/21/85	11,21,36		

Henovironsett Mather HFB November 1995

Table 1. Analysis Type: Alkalinity Results

L#N 000833 		DET 999999
Concen	stration. ma	3/L
ND 50	4 ND	4
7.4	ND	2
	000300  Concer ND 50	000800 000801 Concentration, mo ND 4 50 ND

Analysis date: 11/21/86 11/21/86

Hathar Has November Unit

Table 2. Analysis Type: Alkalinity GA

Sample ().ce:	#B1	MBI 99993	<b>ED</b> ⊎ 00075 <b>4</b>	2 <b>50</b> 20077.)	1ET \$0\$\$33
Compound	Concentration, mg/L				
Bicarbonate Alv., as CaCO3 Carbonate Alv., as CaCO3 Hydroxide Alv., as CaCO3	ды N D N D	0 N 0 N 0 N	120 ND ND	59 22 NO	4
Analysis date:	11-21/86	11/21/86	11/21 85	11/21/85	

Hero (rontes) Mather HPE November (1995

Table 2. Analysis Type: Alkalinity QA

Bample Type:	LDU	L58	LDU	USP	DET
Bample ID#:	000775	0007 <b>84</b>	000798	000770	
น้อ <b>สธ</b> อนกิส		Concentrat	ion, mg/L		
Bicarbonate Alk., as CaCOD Carbonate Hlk., as CaCOD Hidroxide Alk., as CaCOD	51	250	150	100 %	<u>2</u>
	ND	ND	ND	NS	4
	ND	ND	ND	NS	2
analysis date:	11/21/86	11/21/85	11/21/86	11/21/86	

^{% -} percent spike recovery (spiked at 500 mg/L) NS - not spiked

Herivirinter: Mathem 4-3 November 1999

Table 2. Analysis Type: Alkalinity QA

Sample Type:	LSP	LSP	0E↑
Sample ID#:	0007 <b>34</b>	000798	5 <b>399</b> 93
Compound	Sancen	tration.	mg:L
Bicarbonate Alk., as CaCOI	110 %	193	% Z
Carbonate Alk., as CaCOI	NS	NS	
Hydroxide Alk as CaCOI	NS	NS	2

ſ

Analysis date: 11/21/86 11/21/86

% - percent spike recovery (spiked at 500 mg/L) NS - not spiked



Energy & Environmental Division

December 22, 1986

AeroVironment, Inc. 825 Myrtle Avenue Monrovia, CA 91016

Attention: Chris Lovdahl

Subject: Analysis of Mather Air Force Base Samples

Samples were analyzed for bicarbonate, carbonate, and hydroxide alkalinities by Standard Method 403. The results are presented in Table 1 with QA results in Table 2.

Prepared by: __

J. Romeo M. Milanes

Chemist

Approved by:

Greg Micoli

Manager, Inorganic Chemistry

kari : Mathar =8: 1ecarcar : :::

Table 1. Analysis Type: Alvalinity Results

				ยศ <b>ท</b> ปรัชธ. <b>4</b>	
nitaiun:					
ditarochate Alv., as CaCCT lanconate A.v., as lacCT Hudronide Alv., as CaCCT	51 40 40	ND	7.E 4.D 4.D	ND	-
HTA. FELS Cate:	12/09/86	11/19/85	12/09/36	12.0°/85	

ND - hat detected at detection limit

Henio III e Mathen H^e December IIII

Table 1. Analysis Type: Wikalinity Results

Sample Tote: Sample ID#:		14N 909 <b>6</b> 98		UHN 9908.3	087 939939	
<u> გერმმ</u> ლიშ	Concentration, ag/L					
Bicarbonate A.R., as 1a007 Carbonate Alv., as CACOR Hydroxide Alv., as CACOR	59 3 ND	55 ND ND	ФБ Ди Си	177 ND NE	-	
HFa.vsis date:	12 15:95	12/15/86	12/15/86	12:15:86		

NO - not setaited at detection limit

Monther of 1

Tadia i. Hoalvaia Type: Hivalloity Seavita

Bamble (1.pe) Bamble (1.pe)				UHN 25 :11	
15%23W03					
Bicarbonate Alv., as TaCDI	֠	17)	52	÷ ÷	
-Carbonate Hiv., as vacui		٩D		٠. ق	4
Hudroside Alvu, as DaCOD	ND	พบิ	OF	ND	÷
HOAL.FIG HATAL	11 16 24	12715.85	17/15/45	17 15,55	

ND - not detected at detection limit

Hanskunstrant Masha (HPB Dacenter (Pla

Table 1. Analysis Tube: Alkalinity Results

Bample (pe: Bample lu#:	LAN 900 <b>51</b> 7	24N 000514	LAN 909615	EAN (00)815	187 300930		
Jampaund	Soncentration, mg/L						
dicambonate Alk., as GaCGD Dambonate Wik., as CaCGD Hidrograde Alk., as DaCGD	40 12 ND	250 ND ND	50 ND ND	40 43 48	<u>.</u>		
476eis date:	12:15/36	12/15/86	12/15/86	11/15/95			

ND - not selected at detection limit

Heriologic (A) Mathemalia Dasesser (1995)

Table 1. Americas Evpet Alkaginity Results

Sample vie: Sample lu#:		EAN 999513			-	
lomooynd	Johnsentration, mg L					
Bijandonata Wik., as CaCGO Dandonata Wik., as CaCGO Hadnorida Wik., as DaCGO	57 ND ND	E 7 1 2 0 4	5 ) 1 D N D		:	
HRAI-SIE <b>Jatë:</b>	12-15-36	12-15-95	1I 1s 8 <b>s</b>	12 17 95		

(45 - bit setected at detection limit)

Hert I in hard to dather with the Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Common Com

Table 1. Analysis Type: Alkalinity Results

Sample Tude:	umN	_AN	5AN	2#N	087		
Sample II#:	)999521	000522	99≙ <b>5</b> 27	0%0614	599633		
Johacund	Concentration, mg/2						
errandonate Alv., as LaCCC	13	41	7.5	₩₽	-		
Carbonate Hiv., as CaCCC	40	ND	N.S		-		
Hydrovide Hiv., as CaCCC	60	ND	N.D		-		
mnagys.s date:	12:17:3a	12/17/86	12/17/85	12/17 95			

MD - not detected at detection limit

Hen. Intro Manner (178 Jesenser (178

Tabre 1. Hhalvais Type: Alkalinity Results

Banque Loat Banque Lò#:	_~N (00815	jeN 800s≨s	14N 90527	24 <b>%</b> 30±23	15.
langaund					
Estambonate Alk., as CaCCT Cantonate Alk., as CaCCT Higher Alk., as CaCCT	4.2 NB ND		:3 NB NB		:
Hra.vels cate:	12:17/95	12/17/85	11 17 85	11 17 35	

ný - not datacted at detection limit

Hand (1995) Mastan 44 Vacetoen (1995)

Table 1. Analysis Type: Wike.Inity Results

Bancie Tute: pandie 13#:		lAN O≙ésI			
Surasend		•			
Programme Alv., as CaCCT Carconate Alv., as CaCCT month to Alv., as CaCCT	=	NB	พู่เ	NI.	
vralvese dete:	12 17 35	12/17 95	:1 17 98	11:17 Bs	

NO - not retected at detection limit.

Hef volgt a Hightar Welv Tedarber volg

- able 1. - whatvais Type: Wikatingty Results

-3⊼2.8 4: cano.e≢:		5AN 157574			
ama aun a					
Bicarponate Alv., as IaCCT Carponate Alv., as CaCCT Highs ide Alv., as CaCCT		35 ND ND		N D	-
acal.ere date:	10 17 85	11:17:95	12:17 88	12,17 85	

NO ~ not detected at detection limit

Haffi (n. 1997) Matha (1997) Dalamila

Table .. Analysis Type: Alvalimity Results

				EAN 750540	
lempound		******			
Bicarbonate Alk., as CaCCC Carbonate Alk., as CaCCC Hidnoride Alk., as CaCCC	440 MD MD	43 12 ND	_	22.7 N2 N0	-
Analisis data:	12/12/98	10/17/95	10/17/98	17/17/94	

ND - not detected at detection limit

Hengu rottin Matten 489 December 189

Table 1. Analysis Type: Alvalinity Results

Banque Tupe: Bampie 10#:		jan 000 <b>54</b> 2			
lore sur s					
Bitantonate Alv., as CaCGT Carbonate A.K., as CaCGT Historica Alk., as CaCGT		79 12 ND	NE	59 .0 N0	-
enalvais date:	12 17 85	12/17/65	:2 :7 8a	12 17 Be	

NO - not detected at detection limit.

Hentsun inne t Mathen Hho Jedember Unde

Table 1. Abalysis Type: Albalicity Results

Banble (.ta: Banble 10#:		⊆AN 009545	-	14N 000543	23222 -8-		
Johodynd	lancentration, mg L						
Bitarbonate Alv., as IaCOT Cartonate Hiv., as CaCOT Hidroxide Alv. as IaCOT	4 ⁻ #0 ND	4 7 N D N D	4.7 0.0 0.0	• .	: - -		
Analysis date:	17:17:85	12/17/85	12/17/96	12/17/85			

NO - not detected at detection limit.

Henouchor ann Mathemuss Decamber 1989

Table 1. Analysis Type: Alkalinity Results

Sample Time: Sample II#:	•	LAN 39.6550			287
lampound					
Sicarbonate Alk., as GaCOT Carbonate Alk., as CaCOT Hydroxide Alk., as CaCOT	110 ND ND	50 15 NO		47 NB NJ	-
Analysis date:	12,17 85	12/17/86	12/17 85	12/17/85	

NO - not detected at detection limit

Hanguununn Mathemueru December Mee

Table 1. Analysis Type: Alvalinity Results

Sample Tyce: Sample [O#:				LAN 900658	
lompaina					
Picarbonate Alv as CaCCI Carbonate Alv., as CaCCI Hidmolice Alv., as CaCCI	59 ND ND			54 ND ND	-
-nalvels date:	11 1 85	12/17/86	12/17/85	12/17:88	

NO - not detected at detection limit

Hend (notre ) Mathen HPP December (1988)

Table 1. Analysis Type: Alkalinity Results

Sample Cuce: Bample .D#:		ยส <b>พ</b> )ปับธีวิธี	_		187 294427
us mp send					
Bijarbonate Alk., as CaCOI Carbonate A.k., as CaCOI Hydrolide Alk., as CaCOI	55 40 ND	140 ND ND	: 40 ND ND	О М С М С М	
Analysis datë:	12 17 86	12:17/86	12/17/86	12:17/85	

ND - not detected at detection limit

Heno nunn Machar Has Jesensen

Table 1 - Analysis Type: Hovelinity Results

3970.e (28) 3970.e (2#)	_	CET Segase
.1121413	Concertration	. na L
Bosandonate Alevi as CaCCI	4 ~	:
Carbonate H.F., as CaCCC	NΩ	4
- 1 1 le -le, as lalli	ND	·.

era. sis cate: 11 17 86

NO - not detected at detection limit

Herolynon 4 o Mathem 43: December 11:

Table J. Analysis Type: Alkalinity DA

Sample Tue: Sample ID#:	MB1 999793	MB2 99999	₩₽ <u>₹</u> ФФЭФФЗ	∟00 000 <b>61</b> 1	287 203933	
Compound	Concentration, mg/L					
Sicarbonate Alk., as CaCOI	пр	ND	ND	53	-	
Carbonate 41: as CaCOO	N D	ND	ND	ND	÷	
Mydroxide Alx., as CaCOI	ND	ND	ND	ОИ	-	
Hoalvsis data:	12/09/86	12/16/86	12/17/86	12/15/85		

NO - not detected at detection limit

Hather 473 Cacencer 1965

Table I. Analysis Type: Alkalinity QA

Bampie Ivoe:	LDU	∟3 <b>∪</b>	£00	_⊅U	287	
Bample IO#:	000623	000 <b>5</b> 30	≎005 <b>4</b> 5	000a47	99999	
Janobun 1	Concentration, mg/L					
Bicarbonate Alk., as CaCO3	£1	57	4 7	45		
Carbonate Hls., as CaCO3	ND	ND	ND	NB	4	
Hudronide Hlk., as CaCO3	ND	ND	ND	ND		
analysis date:	12/17/86	12/17/85	12/17/86	12/17/86		

ND - not detected at detection limit

HETIOPIE KO Marker Lin December : Ex

Table 1. Hralveis Type: Alkalinity QH

ianole voe: Bakole il≄:				LSP ∂09 <b>5</b> 55		
lamadun:	Concentration, mg/L					
Bitanbonate H.F., as JaCOT Canconate H.F., as JaCOT H.dro ide Hir., as JaCOT			NS		-	
moal.sis date:	12, 17, 35	12/17/85	12/17/36	12/17/85		

ND - not detected at detection limit

%S = not solved
% = spike sample recovery (spiked at 500 mg/L)



DEC 2.2 1986

Energy & Environmental Division

NOVEMBER 22, 1986

AEROVIRONMENT. INC. 825 MYRTLE AVENUE MONROVIA. CA 91015

ATTENTION: CHRIS LOVDAHL

SUBJECT:

ANALYSIS OF MATHER AIR FORCE BASE SAMPLES

SAMPLES WERE ANALYZED FOR BROMIDE. CHLORIDE. FLUORIDE. NITRATE. NITRITE. PHOSPHATE. AND SULFATE ANIONS USING STANDARD METHOD 429 (ION CHROMATOGRAPHY). THE RESULTS ARE PRESENTED IN TABLE 1 WITH QA RESULTS IN TABLE 2.

APPROVED BY:

GREG NIC

MANAGER. INORGANIC CHEMISTRY

Aerovironnest Mather AFB November 1985

Table 1. Analysis Type: 429 Results

Sample Type: Sample ID#:	LAN 000751	LAN 000752	LAN 000753	LAN 000754	DET 9 <b>9999</b> 9
Compound		Conc	entration m	g/L	
Bromide	0.2	0.4	0.2	ND	3.1
Chloride	3.8	5.9	3	7.7	3.1
Fluoride	0.2	0.3	0.2	0.5	9.1
Nitrate, as N	3.2	3.6	2.2	0.3	0.1
Nitrite, as N	ND	ND	ND	ND	0.1
Phosphate, as P	ND	ND	ND	ND	9.1
Sulfate	2.5	5.7	1.7	5.7	0.1
Detection limit factor:	1.00	1.00	1.00	1.00	
Analysis date:	11/12/85	11/12/86	11/12/86	11/12/86	

Aerovironsen Mather AFS November 1985

Table 1. Analysis Type: 429 Results

Sample Type: Sample ID#:	LAN 000755	LAN 000756	LAN 000757	LAN 000758	DET 999999
Compaund		Conce	entration mo	]/L	
Bromide	0.1	0.1	0.1	0.1	0.1
Chloride	7.4	3.2	13	4.4	5.1
Fluoride	0.7	0.2	0.8	0.5	5.1
Nitrate, as N	0.2	3.3	0.2	3.9	1.1
Nitrite, as N	ND	ND	ND	ND	0.1
Phosphate, as P	ND	ND	ND	ND	0.1
Sulfate	16	7.5	26	3.2	0.1
Detection limit factor:	1.00	1.00	1.00	1.00	
Analysis date:	11/12/86	11/12/86	11/12/86	11/12/86	

Table 1. Analysis Type: 429 Results

Sample Type: Sample ID#:	LA <b>N</b> 0007 <b>59</b>	LAN 000760	LAN 000761	LAN 000762	DET
Compound		Cance	entration mo	3/L	
Browlde	0.1	ND	0.1	0.1	2.1
Chloride	18	5.6	3.3	3.2	2.1
Fluoride	0.6	0.3	0.2	0.2	9.1
Nitrate, as N	0.2	0.4	2.3	2.3	₹.1
Nitrite, as N	ND	ND	ND	ND	v. 1
Phosphate, as P	ND	ND	ND	ND	1
Sulfate	28	9.1	4	3.9	0.1
Detection limit factor:	1.00	1.00	1.00	1.00	
Analysis date:	11/13/86	11/13/86	11/13/86	11/13/86	

Table i. Analysis Type: 429 Results

Sample Type: Sample ID#:	LAN 000763	LAN 000764	LAN 000765	LAN 000766	DET 9 <b>999</b> 99
Compound		Conc	entration m	3/L	
Bromide	0.1	0.1	ND	ND	0.1
Chloride	3.6	8.5	2.4	5	0.1
Fluoride	0.3	0.3	0.2	ND	0.1
Nitrate, as N	2.9	1.9	0.4	2.4	J. 1
Nitrite, as N	ND	ND	ND	ND	0.1
Phosphate, as P	ND	ND	ND	ND	0.1
Sulfate	3.7	29	5.8	5.1	0.1
Detection limit factor:	1.00	1.00	1.00	1.00	
Analysis date:	11/13/86	11/13/86	11/14/86	11/14/86	

Table 1. Analysis Type: 429 Results

Sample Type: Sample ID#:	LAN 000767	LAN 000769	LAN 000759	LAN 000770	DET 999999		
Compound	Concentration mg/L						
Bromide	ND	ND	ND	ND	3.1		
Chloride	6	21 2	2.5	2.4	0.1		
Fluoride	0.2	ND	0.1	0.1	6.1		
Nitrate, as N	2.6	0.5	1.1	1.1	9.1		
Nitrite, as N	ND	ND	ND	DM	0.1		
Phosphate, as P	ND	ND	ND	ND	9.1		
Sulfate	6.7	5.5	6.1	6.1	0.1		
Detection limit factor:	1.00	1.00	1.00	1.00			
Analysis date:	11/14/86	11/14/86	11/14/86	11/14/86			

ND - not detected at detection limit times factor z - analyzed on 11/19/86

Herovironment Mather AFB November 1985

Table 1. Analysis Type: 429 Results

Sample Type: Sample ID#:	LAN 000771	LAN 000772	LAN 000773	LAN 000774	DET 99999
Compound		Conc	entration mo	3/L	
Browlde	0,2	ND	0.1	ND	9.1
Chloride	12	ND	7.4	24	0.1
Fluoride	ND	ND	0.1	0.3	0.1
Nitrate, as N	0.6	ND	4.4	ND	0.1
Nitrite, as N	ND	ND	ND	ND	0.1
Phosphate, as P	ND	ND	ND	ND	0.1
Sulfate	3.9	ND	6.2	38	0.1
Detection limit factor:	1.00	1.00	1.00	1.00	
Analysis date:	11/15/86	11/16/86	11/16/86	11/15/86	

Table 1. Analysis Type: 429 Results

Sample Type: Sample ID#:	LAN 🔆	LAN 000775	LAN 000777	LAN 000778	DET 999999
Compound		Conce	entration mo	1/6	
Bromide	0.1	0,2	ND	0.1	9.1
Chloride	6.4	11	7.8	4.9	0.1
Fluoride	0.5	0.1	0.3	0.1	0.1
Nitrate, as N	ND	3.5	0.1	2.6	0.1
Nitrite, as N	ND	ND	ND	ND	0.1
Phosphate, as P	ND	ND	ND	ND	0.1
Sulfate	29	3.3	38	6.8	0.1
Setection limit factor:	1.00	1.00	1.00	1.00	
Analysis date:	11/17/86	11/16/86	11/16/86	11/17/86	

ND - not detected at detection limit times factor Note: Sample 000775 received on 11/17/86

Data for nitrate/nitrite invalid, holding time exceeded

Table 1. Analysis Type: 429 Results

Sample Type: Sample ID#:	LAN 000779	LAN 000780	LAN 0007 <b>81</b>	LAN 000783	DET 999999
Compound		Conc	entration mo	g/L	
Browlde	0.1	ND	ND	ND	1,1
Chloride	7.3	3.7	8.9	3.3	1.1
Fluoride	0.2	0.2	0.4	0.2	3.1
Nitrate, as N	0.5	0.6	0.2	0.9	0.1
Nitrite, as N	ND	ND	ND	ND	$\partial \cdot 1$
Phosphate, as P	ND	ND	ND	ND	6.1
Sulfate	15	12	49	3.7	0.1
Detection limit factor:	1.00	1.00	1.00	1.00	
Analysis date:	11/17/86	11/17/86	11/17/96	11/17/86	

AeroVirthment Mather AFB November 1985

Table 1. Analysis Type: 429 Results

Sample Type: Sample ID#:	LAN 🔏	LAN 000785	LAN 000786	LAN 000787	DET 999999		
Compound	Concentration mg/L						
Bromide	0.2	0.2	0.1	0.3	0.1		
Chloride	22	12	11	14	0.1		
Fluoride	0.2	0.1	0.3	ND	0.1		
Nitrate, as N	0.3	2.6	0.3	0.4	0.1		
Nitrite, as N	ND	ND	0.2	ND	0.1		
Phosphate, as P	ND	ND	ND	ND	0.1		
Sulfate	5.8	8.9	19	48	0.1		
Detection limit factor:	1.00	1.00	1.00	1.00			
Analysis date:	11/18/86	11/17/86	11/17/86	11/17/86			

ND - not detected at detection limit times factor

Data for nitrate/nitrite invalid, holding time exceeded

AeroVironment Mather AFB November 1986

Table 1. Analysis Type: 429 Results

Sample Type: Sample 10#:	LAN 000788	LAN 000789	LAN 000790	LAN 000791	DET			
Compaund	Concentration mg/L							
Bromide	0.2	0.2	0.1	0.1	9.1			
Chloride	24	19	3.8	4	0.1			
Fluoride	0.3	ND	0.2	0.2	9.1			
Nitrate, as N	ND	5.8	1.3	1.4	0.1			
Nitrite, as N	NO	NO	ND	ND	0.1			
Phosphate, as P	ND	ND	ND	ND	0.1			
Sulfate	28	200	2.4	2.5	0.:			
Detection limit factor:	1.00	1.00	1.00	1.00				
Analysis date:	11/17/86	11/17/86	11/18/86	11/18/86				

AeroVironment Mather AFB November 1986

Table 1. Analysis Type: 429 Results

Sample Type: Sample ID#:	LAN 000792	LAN 000793	LAN 000794	LAN 0007 <b>95</b>	DET 99999			
Compound	Concentration ag/L							
Browide	0.6	0.3	ND	ND	0.1			
Chloride	22	29	3.8	3.7	0.1			
Fluoride	ND	ND	ND	0.1	0.1			
Nitrate, as N	0.6	5.8	0.8	2.7	0.1			
Nitrite, as N	ND	ND	ND	ND	0.1			
Phosphate, as P	ND	ND	ND	ND	0.1			
Sulfate	260	10	6	2	0.1			
Detection limit factor:	1.00	1.00	1.00	1.00				
Analyere data:	11/18/86	11/18/86	11/18/86	11/18/86				

Aerovinonment Mather AFS November 1988

Table 1. Analysis Type: 429 Results

Sample Type: Sample ID#:	LAN 000796	LAN 000797	LAN 💥	EAN 3		DET 999393		
Compound	Concentration mg/L							
Bromide	0.3	0.1	0.6	<b>q</b> 0.6	- q			
Chloride	24	7.4	7.4	q 7.9	q	6.1		
Figoride	0.3	0.5	ND	q 0.1	a	3.1		
Nitrate, as N	ù.7	1	1.4	q 1.5	q	0.1		
Nitrite, as N	ND	1	ND	q NE	q q	0.1		
Phosphate, as P	ND	ND	ND	q NE	q	0.1		
Sulfate	100	39	46	q 47	<b>q</b>	9.1		
Detection limit factor:	1.00	1.00	1.00	1.00	)			
Analysis date:	11/19/86	11/19/86	11/21/86	11/21/98	,			

ND - not detected at detection limit times factor

Data for nitrate/nitrite invalid, holding time exceeded

 $^{{\}tt q}$  - Sample originally ran on 11/19/86 on nitric acid preserved aliquot due to laboratory error.

Table 1. Analysis Type: 429 Results

Sample Type: Sample ID#:	LAN >	Ļ	LAN 000801	DET 99 <b>999</b> 9
Compound	C	Con	centration	mg/L
Bromide	0.1	q.	ND	0.1
Chloride	6.8	q	ND	0.1
Fluoride	0.5	q	ND	0.1
Nitrate, as N	0.2	q	ND	0.1
Nitrite, as N	1.1	q	ND	0.1
Phosphate, as P	ND	q	ND	0.1
Sulfate	65	q	ND	0.1
Detection limit factor:	1.00		1.00	
Analysis date:	11/21/86		11/19/86	

ND - not detected at detection limit times factor q - Sample originally ran on 11/19/86 on mitric acid preserved aliquot due to laboratory error.

Data for nitrate/nitrite invalid, holding time exceeded

AeroVironment Mather AFB November 1985

Table 2. Analysis Type: 429 QA

Sample Type: Sample ID#:	MB1 999998	MB2 99998	LDU 000750	LDU 000770	7 <b>3</b> C 999999
Compound		Conce	entration mo	1/L	
Bromide	ND	ND	ND	ND	0.1
Chloride	ND	ND	5.6	2.5	0.1
Fluoride	ND	ND	0.3	0.1	0.1
Nitrate, as N	ПN	ND	0.4	1.1	0.1
Nitrite, as N	ND	ND	ND	ND	0.1
Phosphate, as P	ND	ND	ND	ND	0.1
Sulfate	DM	ND	9	6.1	9.1
Detection limit factor:	1.00	1.00	1.00	1.00	
Analysis date:	11/12/86	11/15/86	11/13/86	11/14/86	

Danes.

Table 2. Analysis Type: 4

				,			
Sample Type: Sample ID#: Compound	LDU 900771	LDU 000778	000 <b>8</b> 01 CDU	LDU 000770	DET 999999		
	Concentration mg/L						
Bromide	0.1	0.1	ND	ND	0.1		
Chloride	11	4.7	ND	2.5	0.1		
Fluoride	ND	0.1	ND	0.1	0.1		
Nitrate, as N	0.6	2.6	ND	1.1	0.1		
Nitrite, as N	ND	ND	ND	ND	0.1		
Phosphate, as P	ND	ND	ND	ND	0.1		
Sulfate	3.9	6.7	ND	6.1	0.1		
Detection limit factor:	1.00	1.00	1.00	1.00			
Analysis date:	11/15/86	11/17/86	11/19/86	11/14/86			

AeroVironment Mather AFB November 1986

Table 2. Analysis Type: 429 QA

Sample Type: Sample ID#:	LSP 00074 <b>5</b>		LSP 000778		LSP 000797		LSP 999997		2ET 999999
Compound		-	Con	- c e i	itration	ng.	/L	-	
Bromide	92	- %	38	- %	98	- %	NS	-	9.1
Chloride	90	Z,	89	7.	97	7.	96	•	0.1
Fluoride	95	۲,	82	7.	91	7.	110	ŧ	0.1
Nitrate, as N	₹1	7	90	7,	100	%	90	*	0.1
Nitrite, as N	89	7	89	7.	95	7,	NS		0.1
Phosphate, as P	90	7,	87	%	84	ኢ	89		0.1
Sulfate	95	7.	95	7.	100	7.	98	+	5.1
Detection limit factor:	1.00		1.00		1.00		1.00		
Analysis date:	11/14/86		11/17/86		11/19/86		11/20/96		

ND - not detected at detection limit times factor

NS - not spiked

% - percent recovery (spiked at 1.0 mg/L)

+ - percent recovery of Quality Control sample 9903

AeroVironment Mather AFS November 1985

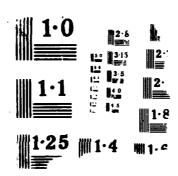
Table I. Analysis Type: 429 QA

Sample Type:	MB3	DET
Sample ID#:	499998 	999999
Compound	Concentrat	ion mg/L
Sromide	ND	0.1
Chloride	ND	0.1
Fluoride	ND	0.1
Nitrate, as N	ND	0.1
Nitrite, as N	ND	0.1
Phosphate, as P	ND	0.1
Sulfate	ND	0.1

Detection limit factor: 1.00

Analysis date: 11/21/86

UNCLASSIFIED F33615-83-0-4669 57 FEB 88 NO-19-86/396 F/G 24/4 NC	/	AD-A194 900	INSTALLATION RESTORATION PROGRAM PHASE 2 CONFIRMATION QUANTIFICATION STAGE 3(U) AEROUIRONMENT INC. MONROUIA CA 05 FEB 88 AU-FR-86/396	8/10	6
		UNCLASSIFIED	F33615-83-D-4660 F/G 24/4	HE.	
	_				





**Energy & Environmental Division** 

December 18, 1986

AeroVironment, Inc. 825 Myrtle Avenue Monrovia, CA 91016

Attention: Chris Lovdahl

Analysis of Mather Air Force Base Samples

Samples were analyzed by ion chromatography for bromide, chloride, fluoride, nitrate, nitrite, phosphate, and sulfate anions using Standard method 429. The results are presented in Table 1 with QA results in Table 2.

M. Milanes Approved by: Greg Micoll

Maprager, Inorganic Chemistry

Aenswinshtern Mather AFB December 1985

Table 1. Analysis Type: 419 Results

Sample Type: Sample ID#:	LAN 000801	•	LAN 0008)I	£#N 3005€4	3 <b>6</b> 7 009000
Compound		Sance	entration mo		
Gramide	40	ND	0.2	0.2	
Chloride	5.8	5.2	10	13	
Fluorida	ა. 2	ND	CM	ND	:
Nitrate, as N	2.0	1.9	0.5	ે.5	
Mithite, as N	ND	0.3	#5	₩D	1.1
^e nosphate, as ^e	ND	ΝD	t D	₩D	5.1
Sulfate	7	7.5	5	⁻ .9	).:
Jetection limit factor:	1.00	1.00	1.00	1.20	
Analysis date:	12/09/85	12/09/85	12/09/86	12/09/88	

Hentvinghtent Mathem WF5 December 1985

Table 1. Analysis Type: 429 Results

lampie Tvoe: Sample ID#:	LAN 000605	=	EAN 000 <b>5</b> 07	£AN 20050 <b>8</b>	257333
Lomecund		Conce	entration mo	] / L	
Gramide	מא	).5	0.1	9.2	
înlaride	2.5	3.5	5.7	5.3	
Fluoride	ND	NE	ND	พย	
Mitrate, as N	1	♦.3	4	4	
Nichite, as N	NO	ND	ND	ND	J. 1
Frosphate, as P	ND	N D	ND	ND	
Bulfate	3.3	<u> </u>	<b>s.</b> 3	٤.2	6.1
Deteriion limit factor:	1.00	1.00	1.00	1.00	
Analysis date:	12/19/85	12/10/85	12/10/85	12/10/85	

Herovironient Mathem HPE December 1986

Table 1. Analysis Type: 429 Results

Bancie voe: Bancie ID#:	∟н <b>№</b> 90050 <b>9</b>		E#N 000611	⊾∺N .0051I	087 \$435:5
.omobund	Egncentration mg/L				
Growide	0.3	9.2		J. 4	1
Ch.oride	10	1.4	ა. 5	3,9	
Eluphide	9.2	ND	0.2	0.2	
Nitrate, as N	ND	3.2	ND	ND	.:
Nitrite, as N	ND	ND	٩D	f + D	٠.:
Angephate, as P	Νū	ND	ND	۵N	9.1
Bullate	15	9.5	3.9	2	J.:
Detection limit factor:	1.00	1.00	1.00	1.00	
Acalosis Jate:	12/19/86	11/10/85	11/19/96	12/10/85	

Aerovironteit Mather ASS December 1985

Table 1. Analysis Type: 429 Results

Bamble Type: Bample ID#:	EAN 000513	LAN 000514	LAN 000615	LAN 000515	3 <b>5</b> 7 9999:
Campauna		Conc	entration mo	9/L	
- Bromide	0.5	), 4	0.2	j. 2	.:
Epicride	3.6	16	2.8	11	
Fluaride	ND	110	0.2	NE.	4.1
Nitrate, as N	ND	1.1	1.4	3.5	3.1
Mithite, as A	*4 D	ND	N D	₩Ď	٠
Phosphate, as P	ND	МÐ	ND	±.D	6.1
Eulfate	6	190	2.4	1.2	<b>0.1</b>
Detection limit factor:	1.90	1.00	1.00	1.00	
Analysis date:	12/10/85	12/10/95	12/11/85	12/11/35	

Mathem WES December 1985

Table 1. Analysis Tyde: 429 Results

Samble //pe: Sample Iu#:	LAN 000 <b>51</b> 7		LAN 000519	EHN 000820	257:15 257:15
Linguand		Conce	entration mo	] / <b>_</b>	
éramide	ND	:.3	ND	2.1	.:
Intoride	4.5	3.2		3.3	.:
Fluoride	ND	2 4 6	9.2	<b>4</b> D	
Nitrate, as N	1.3	ND	2.3	4.4	
Altrice, as N	ND	סא	dr	4D	.:
shosphate, as P	םני	ND	ND	.1 D	1
Surfate	5.3	3.0	1.2	5.4	• •
Detection limit factor:	1.00	1.70	1.00	1.00	
-nalvara data:	12-11/86	12/11/85	12/11/85	12/11/35	

Herovinontant Mather AF5 December 1-35

Table 1. Analysis Type: 429 Results

Bample T.pe: Bample IO#:	CAN 000 <b>521</b>	CAN 000522	LAN 00062T		[27 092223
lampaund		Canc	entration m	; ·L	
Brownia	ND	Nû	ND	ND	
Sm.oride	8.1	2.5	5.5	ŧ	. :
Fluorise	ND	ND	ND	M D	
Nitrate, as N	ир	1.7	ND	ND	.:
Nitrite, as N	GF	МD	NO	ND	
Phosphate, as P	40	ND	N D	<b>\</b> D	. :
Sulface	ND	1.9	0.4	NO	1
Detection limit factor:	1.29	1.99	1.90	1.00	
HRalysis date:	12/11/86	12/11/95	12/11/85	12/11/85	

Hero incomes: Mather HPB December 1988

Table 1. Analysis Type: 429 Results

Bample Tupe: Bample ID#:	LAN 000815	_AN 000626	LAN 000527	_AN 000519	151
ברובסתכו		Conce	entration mo	)/L	
- Bromide	ND ND	ND	ND	40	.:
Shipride	2.5	7.5	4.3	4.1	
S.Jorida	<b>*</b> £0	C 14	ND	<b>^</b> 3	:
Mitrate, as N	1.3	ND	0.5	ND	1
Nitrite, as A	ND	ħ₄D	ND	٧D	).:
Phosphate, as P	ND	ND	ħΦ	פא	<b>⊕.</b> ‡
Suifate	1.5	СИ	်. s	ND	
Detection limit factor:	1.00	1.00	1.00	1.10	
analysis data:	12/11/85	12/11/96	12/11/85	12/11/86	

Herovinonnern Machen HFS December 1995

Table 1. Analysis Type: 419 Results

Sample Type: Sample 15#:	_HN 000529	LAN 000650	LAN 000651	LAN 900sid	35- 199999
lakodund	Concentration mg L				
- Eromide	ND.	ND	0,2	3.7	
Crioride	1.1	1.1	19	1.7	
Fluoride	NĐ	9.2	ΝD	<b>⊍.4</b>	
Nitrate, as N	ND	ND	5.3	0.9	4.1
Nitrite. as N	ND	NÐ	٥.٦	ND	5.1
Endsphate, as P	<b>1</b> D	МÐ	ND	ПN	1.1
Bulfate	12	12	210	50	4.1
Detection limit factor:	1.00	1,00	1.00	1.00	
Analysis date:	12/12/86	12/12/86	12/12/86	12/12/35	

tip - not detected at detection limit times factor

Hendysnintert Mathem 193 December 1932

Table 1. Analysis Type: 419 Results

Sample Type: Sample ID#:	LAN 0006IJ	LAN 30063 <b>4</b>	LHN 000635	iaN 00053a	JE*
Danasand	•	Conci	entration mo	; · L	
Bromide	9.3	0.2	),5	ND	
Intoride	4.4	4.9	4.5	ND	
Fluchida	J.2	0.2	0.2	ND	. :
Nitrate, as N	1.1	2	9.8	ND	
Nitrite, as N	J.5	CM	0.4	~ D	4
Phosphate, as ^o	CN	ND	ΝĐ	N 5	
Bulfate	14	1.7	21	ΝΩ	<i>2.</i> ★ ★
Setection limit factor:	1.00	1.00	1.00	1.00	
Analysis date:	12/12-86	12/12/85	12/12-36	12/12 98	

AeroVironment Mather AFS December 1985

Table 1. Analysis Type: 429 Results

Sample Type: Sample ID#:	LAN 000637	LAN 000638	LAN 000639	LAN 000640	DET 999999			
Compound	Concentration mg/L							
Bromide	0.6	0.6	0.2	0.2	9.1			
Chloride	20	3.4	28	22	0.1			
Fluoride	ND	0.2	0.2	0.2	0.:			
Nitrate, as N	0.7	ND	ND	0.8	9.1			
Nitrite, as N	ND	ND	ND	ND	0.1			
Phosphate, as P	ND	ND	ND	ND	0.1			
Sulfate	240	2	6.2	5.3	0.1			
Detection limit factor:	1.00	1.00	1.00	1.00				
Analysis date:	12/12/86	12/12/86	12/14/86	12/14/86				

*:** *:**** LEIST 4 ...

Typua iv - knyl ska fyda: +l+ Healtha

:: 1.e				4 2 -	
		.2726	entration as		
Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  Endings  End	, <u>.</u>			4. **	
Noticial as 1 Incapate las ^e Elimate	<b>'4</b> ]				
Lenact in Lunit Hactors				1	
anal sis sate:	11 14 38	12 14 35	12 1- 35	12 14 35	

No non deserted at resettion limit times ractor.

Herby:ronnerr Mather HEE December 1985

Table 1. Analysis Type: 429 Results

Sample Type: Sample [O#:	LAN 000 <b>645</b>	LAN 000546	LAN 000547	LAN 000543	[E" :35333
Compound					
Bromide	0.5	0.4	ND	NE	.:
Chloride	3.7	2.9	2.4	16	• . :
Fluoride	).ī	0.3	0.2	VD	. 1
Nitrate, as N	1	ND	1.3	5.4	:
Nitrite, as N	ND	ND	ND	ND	9.1
Phosphate, as P	ND	0.5	ND	ND	1
Sulfate	2.1	5	4.5	:0	w • 🕻
Detection limit factor:	1.00	1.00	1.00	1.00	
Analysis date:	12/14/85	12/14/86	12/14/85	12/14/85	

Herovinontest Mathem HPE December 1995

Table 1. Analysis Type: 429 Results

Bample Type: Bample ID#:	LHN *	LAN 🛠	LAN ★ 000851		3ET \$\$\$ <b>\$</b> \$\$
Sumpound		Conce	entration mo	1/L	
Scomide	9,2	0.5	ND	ND	,:
Chicride	2.9	3.9	1.2	3.1	
Fluoride	0.2	3.3	0,2	0.5	· .
Nitrate, as N	2.2	N D	3.2	3.4	1.1
Nitrite, as N	ND	N Đ	ND	ND	4.1
Phoschate, as F	ND	ND	N D	ND	• • •
Bulfate	4.3	3	2.5	2.8	0.1
Setection limit factor:	1.00	1.00	1.00	1.00	
Analysis date:	12/15/85	12/15/85	12/16/86	12/15/85	

No - not detected at detection limit times factor

Data for nitrate/nitrite invalid, holding time exceeded

Herovironnenn Mather HEB December 1985

Table 1. Analysis Type: 429 Sesults

Sample Type: Sample ID#:	199657	LAN 000 <b>55</b>	LAN 900659	LAN 000550	;;;;;;			
Janpaund	Concentration mg/L							
Bromite	9.4	NS	CM	ND				
Chloride	4.7	5	5	ND				
Fluoride	. 3	0.2	. 2	†: <b>Ω</b>	.:			
Nitrate, as N	ND	:.3	1.8	ND	1			
Nitrite: as 3	ND	N D	ND	C M	1			
Phosphate, as P	NŞ	<b>↑</b> ≀ D	В	พอ	6.1			
Sulfate	7.5	19	16	ND	9.1			
Detection limit factor:	1.00	1.20	1.00	1.00				
Analysis date:	12-15/85	12-15/85	12/15/85	12/15/35				

MD - not detected at detection limit times factor

Data for nitrate/nitrite invalid, holding time exceeded

Aerovinonterr Mather AFE December 1985

Table 1. Analysis Type: 419 Results

Samble Tupe: Sample ID#:	LAN 🗡	CAN ★	LAN *	24 <b>N ★</b> 999858	∑E⊺ oşgişi			
Compound	Concentration mg/_							
ärom:de	מא	6,4	9.4	ND	3.1			
Chloride	3.5	2.4	2.4	7.4				
Riupride	9.2	0.2	≎.2	3.2	1.1			
Nitrate, as N	3	0. <b>4</b>	ND	2.7	0.1			
Nitrite, as N	МD	*10	NO	ND	0.1			
^o nosphate, as ^o	ND	В	ND	מא	9.1			
Sulfate	1.1	5.9	4.5	4.2	9.1			
Betection limit factor:	1.00	1.00	1.00	1.90				
analysis date:	12/16/95	12/15/85	12/15/86	12/15/85				

ME - not detected at detection limit times factor

Data for nitrate/nitrite invalid, holding time exceeded

Aerovinontent Mather AFB December 1985

Table 1. Analysis Type: 429 Results

Sample Type:	LAN	DET
Sample ID#:	000561	999999
Compound	Concentrati	ion mg/L
Bromide	ND	0.1
Chloride	3.4	0.1
Fluoride	0.4	0.1
Nitrate, as N	4.1	0.1
Nitrite, as N	ND	0.1
Phosphate, as P	ND	9.1
Sulfate	1.5	0.1

Detection limit factor: 1.00

Analysis date: 12/15/36

Hero Promess Mather HFH December 1986

## Analysis Type: 419 14

Bample Tude: Bample II#:	MB1 999998	ME2 999993	<b>48</b> ] 999973	M94 203009	587 329:33			
Domabund	Concentration mg L							
- Bromide	ND	:.0	ND	ND				
îhloride	74 D	ND	ND	ND				
Flishide	45	ND	ND	ND				
Nitrate, as M	ND	ND	ND	ND	. 1			
Nitrice, as N	NO	NO	ND	ND	<i>i</i> .:			
Phosphate, as P	NO	ND	ND	นอ	0.1			
Eulfate	40	ND	CN	40	7.1			
Detection limit factor:	1.90	1.30	1.92	1.00				
Analysis date:	12/10/35	12/11/96	12/12/96	12/14/85				

Aerovinontant Mathem 488 December 1985

Analysis Type: 429 0A

Sample Tupe: Sample IS#:	MB5 २ <b>१</b> २१९८	LDU 000 <b>5</b> 07	LDU 000 <b>52</b> 2	LDU 000 <b>5</b> 13	0 <b>6</b> 1 quadas				
Campound	Concentration mg/L								
3ronide	ир	0.2	ND	9.2	.:				
Chlorida	ND	7	2.5	4.4					
Fluoride	СИ	CN	ND	0.2					
Nitrate, as N	N D	4	1.5	1.1					
Nitrite, as N	ND	ND	ND	<b>0.5</b>	0.1				
Phosphate, as P	ND	ND	ИD	UP	0.1				
Sulfate	ND	5.5	1.3	14	9.1				
Setection limit factor:	1.00	1.00	1.00	1.90					
Analysis date:	12/15/95	12/10/85	12/11/85	12/12/85					

Hero Provide Mather HPH December 1995

Analysis Type: 429 JA

Bamble Type: Bamble II#:	∟38 010 <b>545</b>	155 000 <b>≈4</b> 7	∟10 100e55	_35 %)all		357 357
Conssund						
- Browlide	9.4	ND	0,4	39	• •	• • • • • • • • • • • • • • • • • • • •
îr.oride	2.4	2.5	2.5	2.4	·/.	
Fluoride	1.7	1.1	0.1	9]	•.	, )
Nitrate, as N	ND	1.7	0.1	116	٠.	. :
Nitrite, as N	N.C.	ND	ND	29	•	
Phosphate, as P	0.5	.1 D	ND	5.5	•	
Sulfate	5	4.5	4.5	195	•1	1.1
Cataction limit factor:	1.00	1.90	1.00	1.90		
Analysis gate:	12/14/85	12/14/86	12/15/36	12/11/95		

MD in not detected at detection limit times factor  $t_{\rm c}=7\,{\rm ergent}$  solve necovery, spiked at 1.0 mg/L)

Hemovico ne Machen (HFB) December (1999)

## Analysis Type: 419 0A

Bandle [/cs: Bandle []#:	€3P 000674		USF 000555	_	DET 999903
Compound	3	: מחם:	entratio	20	mg/L
Brimida	95	•	105		3.1
lation:de	91	7.	96		9.1
S limide	34	٧.	= 2	7,	0.1
Mitrata, as N	75	•	100	7,	0.1
Nitrite, as N	9.2	<b>'</b> '.	9.9	Υ,	1.1
Phosopate, as ^e	9급	*	99	*	0.1
Solfate	95	٧,	9 ₽	*′,	9.1
Setection limit factor:	1.00		1.00		1.00
Analysis date:	12/12/35	1	2/16/95		12 16/86

NO - not detected at detection limit times factor  $\tau$  - Percent spike recovery (spiked at 1.0 mg/L)



Energy & Environmental Division

or.

NOVEMBER 22, 1986

AEROVIRONMENT, INC. 825 MYRTLE AVENUE MONROVIA, CA 91015

ATTENTION: CHRIS LOVDAHL

SUBJECT:

ANALYSIS OF MATHER AIR FORCE BASE SAMPLES

SAMPLES WERE ANALYZED FOR PETROLEUM HYDROCARBONS BY EXTRACTION WITH FREON. PASSING THE EXTRACT ACROSS SILICA GEL. AND THEN ANALYZING THE SOLVENT BY INFRARED SPECTROSCOPY USING EPA METHOD 418.1. THE RESULTS ARE PRESENTED IN TABLE 1 WITH QA RESULTS IN TABLE 2.

LORNA IMBAT
ANALYST

APPROVED BY:

GREG NICOLL

MANAGER. INORGANIC CHEMISTRY

Herbylngthett Mather HFS November 1985

Table 1. Analysis Type: 418.1 Results

Sample Type: Sample ID#:	LAN 000790	LAN 000791	LAN 000801	DET 99999	
Sampound		ation mg/L	/L		
Petroleum Hydrocarbons	ND	ND	ND	1	
Detection limit factor:	1.00	1.00	1.00		
Analysis date:	11/21/86	11/21/86	11/21/86		

Heroviciones Mather H^{PE} November L^{PE}s

Table 2. Analysis Type: 418.1 0A

Sample f.pe:	MB1	DET
Sample 10#:	999668	999999
Compound	Concentrati	.on mg/L
Petroleum Hydrocarbons	ND	1

Detection limit factor: 1.00

Analysis date: 11/21/86



Energy & Environmental Division

December 22, 1986

AeroVironment, Inc. 825 Myrtle Avenue Monrovia, CA 91016

Attention: Chris Lovdahl

Subject:

Analysis of Mather Air Force Base Samples

Samples were analyzed for petroleum hydrocarbons by extraction with freon, passing the extract over silica gel, and measuring the hydrocarbon peak of the extract by infrared spectrometry using EPA Method 418.1. The results are presented in Table 1 with QA results in Table 2.

Prepared by:

J. Romeo M. Milanes

Chemist

- Approved by:

Manager, Inorganic Chemistry

Minney July Lêigyon

Table 1. Analysis Type: 413.1 Results

Tamble Type:	1	SET
Sample 11#:	. 7573	20222
10 <b>75</b> 0073		on mg/L
Setroleum Hudroogroons	ND	1

Cataction Limit Hactor: 1.48

Analysis date: 10 18 85

Hens und Mistren Hilb December in Ki

- Table I. - Analysis Type: 418.1 IA

tard.a cet	₩ 등 <u>1</u>	SET
Bast.e 11≢:	ခ္ခရာချ	353500
10700170	Concentratio	on mart
Patrola.a Hydrolarddna	٧D	1

Setabrior limit factor: 1.00

Analysis date: 12/18/85

NE - Fit selected at detection limit times factor



## Energy & Environmental Division

December 2, 1986

AeroVironment, Inc. 325 Myrtle Avenue Monrovia, CA 91016

Attention: Chris Lovdahl

Subject:

Analysis of Mather Air Force Base Samples

Samples were analyzed for total cyanides by distillation/colorimetry (EPA method 335.2). The results are presented in Table 1 with QA results in Table 2.

June Romeo Maramba Milanes Chemist

Approved by:

Manager, Inorganic Chemistry

Herolinomen Mather Hee November Hee

Table 1. Analysis Type: IIS.2 Results

Sample I.pe: Sample IO#:	LAN 0007 <b>84</b>	LAN 0007 <b>8</b> 5	LAN 0007 <b>8</b> 6	LAN 000787	2E7 494399
Campaund	Concentration mg/L				
Total Syanides	0.02	ND	ND	ND	0.015
Detection limit factor:	1.00	1.00	1.00	1.09	
Analysis date:	11/25/85	11/26/85	11/25/86	11/25/85	

Henry Promise -Mather Hes November (1985)

Table 1. Analysis Type: 335.2 Results

Eample T.pe: Eample ID#:	LAN 0007 <b>88</b>	CAN 000789	LAN 000790	EAN 000791	0ET 909055
lompound		Conce	centration mg/L	9/L	
Total Evanides	סא	ND	ND	N D	
Detection limit factor:	1.00	1.00	1.00	1.00	
Analysis date:	11/25/96	11/25/85	11/26/86	11/25/85	

Herovicontent Mather AFS November 1885

Table 1. Analysis Type: 135.2 Results

Sample T.pe: Sample 10*:	LAN 000792	LAN 000793	LAN 000794	LAN 00079 <b>5</b>	DET
Compound	Concentration mg/L	g/L			
Total Cyanides	ND	ND	ND	ND	0.775
Detection limit factor:	1.00	1.00	1.00	1.00	
Analysis date:	11/25/96	11/25/85	11/25/85	11/25/85	

Hendylnonnern Mathem HFB November (Fbb

Table 1. Analysis Type: 775.2 Results

Sample T.pe: Sample 15#:	LAN 000796	LAN 000797	LAN 9007 <b>99</b>	LAN 300799	DET agasas
Campaund		Jones	entration m	9/L	
Total Cranides	ND	0.025	ND	ND	) T
Detection limit factor:	1.00	1.00	1.00	1.00	
Analysis date:	11/25/85	11/25/85	11/26/86	11/25/86	

Mather wes November 1981

Table 1. Analysis Type: 375.2 Results

Sample Type: Sample ID#:	CA <b>n</b> 009 <b>8</b> 00	LAN 000801	DET 9 <b>999</b> 99
Campound	Co	oncentration	mg/L
Total Cyanides	0.02	ND	0.005
Setection limit factor:	1.00	1.00	
Analysis date:	11/26/85	11/26/86	

Henz unit ett Mathen HFB November (Bes

Table 1. Analysis Type: 305.2 QA

Bample Type: Bample ID#:	MB1 999998	LDU 000795	LDU 000795	LSP 000797	264 326324
Compaund		Conce	entration mo	3/L	
Total Evanides	ND	ND	ND	75 %	34 F
Detection limit factor:	1.90	1.00	1.00	1.00	
Analysis date:	11/25/86	11/25/85	11/25/85	11/25/85	

ND - not detected at detection limit times factor % - percent spike recovery (spiked at 0.10 mg/L)

Herolinontent Mather HPS November 1985

Table 1. Analysis Type: II5.2 GA

Bample Type:	LSP	DET
Sample ID#:	999997	299999
Compound		
Total Evanides	100 %	0.005

Detection limit factor:

1.00

Analysis date:

11/25/85

ND - not detected at detection limit times factor

* ~ percent recovery of Quality Control sample 9903 (0.12 mg cyanide/L)



Energy & Environmental Division

December 22, 1986

AeroVironment, Inc. 825 Myrtle Avenue Monrovia, CA 91016

Attention: Chris Lovdahl

Subject: Analysis of Mather Air Force Base Samples

Samples were analyzed for total cyanides by distillation/colorimetry using EPA Method 335.2. The results are presented in Table 1 with QA results in Table 2.

Chemist

ager, Inorganic Chemistry

Heft of Matham Has Departed

### Table 1/ Analysis Type: IIE/1 Results

nantive înne) danbie≇:				อล์ซ บทซิธ1โ	
13 1 <b>2</b> 3 17 3		longa	entration m	; -	**- <b>*</b> ****
Total Ivanites	,0	ND	NO	NC.	
leteitismmit mastem:	1	1	1. 2	1.	
analusis tate:	12 19 35	12 19 95	12 19 86	12 17 88	

the earth detected at detection wimit times factor.

net Magelin e 1 Descriptor e 1

# Table 1. Hhalvais Type: 775.2 Sesuits

Barbie de: Barbie III:		A44 109 <u>5</u> 29			
.::::::::::::::::::::::::::::::::::::::		Janse	ntration אפ	; -	
Total Cvancoes	13	*:0	N2	• 5	
Seteption Lumit rector:	1	1.10	1	1	
L e s tata:	12 19/85	12 19/85	12 17 35	12 19 95	

Sanni (1997) Mathan Lin Sacathan (1998)

Table 1. Analysis Type: IIS.I Sesuits

cemple loe: Bangle 10#:				_AN 0000575	
_ 1 % 2 0 un 1		Sanci	entration m	} -	
Total Ivanides	ND	ND	พอ	`\ j	, :
Detection limit factor:	1.20	1.99	1.00	1.53	
-malvais cate:	12/19/85	12 19/85	12-19-85	12 19 35	

er jaron e Marine Güerger jaron

Table 1. Howlists Type: JTS.1 Pesuits

Sangre (C#)	งค์ที่ วิที่กรไร	្នក់ស ១១២៦ រឺ ពិ	244 273 ± 73	्रस <b>भ</b> १८ इ.7	287 4344.
. 1 AO 1 .n 3		lanz	 n tration n	 Ç L	
Tote. Livanidas	NS	710	ND	70	, ,
leheitism limit hactor:	1.01	1. %	1.00	1	
analysis date:	12 17 88	:2 17 95	12.19 35	12/19/98	

 $\mathfrak{R}_{\mathsf{L}}$  = not detected at detection during thines factor

Hent until vi Mathem Hilb December 1999

Table 1. Analysis Type: 775.2 Results

Sample fice: Sample ID#:	CAN 000840	LAN 009 <b>541</b>	3ET 99999
Comesund	Ca	ncentration	mg · L
Total Transdes	ND	ND	0.005
Detection limit ractor:	1.00	1.00	
analisis data:	12/19/35	12/19/85	

Hens officers Mathematical Setensers re

Facte 1. Analysis Type: 175.1 34

Burgle rune: Bedgie Bi <b>#:</b>				25t 30514	
.5/00 / 1		Conca	entration mo	; L	
Total Ivanides	NU	<b>"10</b>	N <b>0</b>	NI.	. 1
Detection limit factors	1.70	1.00	1.00	1. m	
Healvels date:	12/19 38	12/19/35	12 19 86	12 19 95	

Hertoloo Mannemolem December oloo

Table 1. Hoalvais Type: DIE.1 14

tamole Tile: Samole IS#:	ლ <u>ნ</u> შ ტემ <b>ს 4</b> 0	73G \$2\$\$\$\$
Langaund	Concentration	mą/L
Total Cyanides	:00 %	0.005

Letaction ..mit ractor: 1.00

remaisers tetat 12/19/36

%D = rot detected at detection limit times factor
% = sol e recovery (sample spiked at 0.1 mg/L)



**Energy & Environmental Division** 

: 247

wa's - , ...

December 2, 1986

AeroVironment, Inc. 825 Myrtle Avenue Monrovia, CA 91016

Attention: Chris Lovdahl

Subject:

Analysis of Mather Air Force Base Samples

Samples were analyzed for total phenols by distillation/colorimetry (EPA method 420.1). The results are presented in Table 1 with QA results in Table 2.

Approved by:

Manager, Inorganic Chemistry

Herovinorient Mathem HAB November 1985

Table 1. Analysis Type: 420.1 Results

Sample Type: Sample ID#:	LAN 000790	LAN 000791	000801	DET 9 <b>999</b> 99
Sompound	_	Concentra	ition mg/L	
Total Phenois	0.024	0.046	0.030	0.005
Detection limit factor:	1.00	1.00	1.00	
Analysis date:	11/25/86	11/25/85	11/25/96	

Herovaronnen Mashen Hee November 1988

Table 1. Analysis Type: 420.1 Results

Sample Type:	MB1	USP	DET
Sample [2#:	999999	999997	999999
Compaund	Co	mg/L	
Istal Phenois	N D	115 +	0.005

Detection limit factor: 1.00 1.00

Analysis date: 11/25/86 11/25/86

ND - not detected at detection limit times factor

* - percent recovery of Quality Control sample 990% (0.085 mg phenol/L)



#### Energy & Environmental Division

December 22, 1986

AeroVironment, Inc. 825 Myrtle Avenue Monrovia, CA 91016

Attention: Chris Lovdanl

Subject: Analysis of Mather Air Force Base Samples

Samples were analyzed for total phenols by distillation/colorimetry using EPA Method 420.1. The results are presented in Table 1 with QA results in Table 2.

Prepared by:

J. Romeo M. Milanes

Chemist

Approved by: She hickly Greg Nicoll

Manager, Inorganic Chemistry

Herz un in Mathematika December (3)

## Table 1. Analysis Type: 420.1 GA

Bample Tupe:	LAN	5 E =
Sample II#:	2. <b>5</b> 78	343435
lampqund	Iontentrati	on mg L
Tatal Frencis	ND	5

Detection limit exctor:

Amalysis date: 12 is %s

## Table 1 -halvala Tybe: 41 .1 IA

panova ^T ipan Biro e post	*£: 45;	
entral Electrical Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Company of the Com	Concentrati	
Total Phanils	ND	a.0v5
Catection contractor:	1.19	

NO rich detected at defection limit times factor



Energy & Environmental Division

NOVEMBER 22, 1986

AEROVIRONMENT. INC. 325 MYRTLE AVENUE MONROVIA. CA 91013

ATTENTION: CHRIS LOVDAHL

SUBJECT: ANALYSIS OF MATHER AIR FORCE BASE SAMPLES

SAMPLES WERE ANALYZED FOR TDS USING EPA METHOD 160.1. RESULTS OF THE GRAVIMETRIC MEASUREMENTS ARE PRESENTED IN TABLE 1 WITH QA RESULTS IN TABLE 2.

INORGANIC CHEMISTRY

f.

Aerovirontent Mather 488 November 1985

Table 1. Analysis Type: 160.1 Results

Sample Type: Sample ID#:	LAN 000751	LAN 000752	LAN 000753	LAN 000754	200000 200000
Compound	Concentration mg/L				
Total Dissolved Solids	170	190	170	100	; ;
Detection limit factor:	1.00	1.00	1.00	1.00	
Analysis started:	11/12/36	11/12/86	11/12/86	11/12/86	

Herovironment Mather HEE November 1988

Table 1. Analysis Type: 160.1 Results

Sample Type: Sample ID#:	LAN 0007 <b>55</b>	LAN 000756	LAN 000757	LAN 000758	DET 999999
Compound	Concentration mg/L				
Total Dissolved Solids	100	150	200	120	1
Detection limit factor:	1.00	1.00	1.00	1.00	
Analysis started:	11/12/86	11/12/86	11/12/86	11/12/86	

Mather WEE November 1985

Table 1. Analysis Type: 150.1 Results

Sample Type: Sample ID#:	CAN 0007 <b>5</b> 9	LAN 900760	LAN 000751	LAN 000752	DET 999999
Sampound					
Total Dissolved Solids	140	31	130	170	
Detection limit factor:	1.00	1.00	1.00	1.50	
Analysis started:	11/13/85	11/13/86	11/13/86	11/13/85	

Herovironnent Mather AFB November 1985

Table 1. Analysis Type: 150.1 Results

Sample T.se: Sample ID#:	LAN 000763	LAN 00076 <b>4</b>	LAN 000765	LAN 000766	DET 99999
Campound	Concentration mg/L				
Total Dissolved Solids	1 30	230	120	120	1.
Detection limit factor:	1.00	1.00	1.00	1.00	
Analysis started:	11/13/86	11/13/85	11/14/86	11/14/86	

ND - not detected at detection limit times factor

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Herbylronnenn Mather AFE November 1989

Table 1. Analysis Type: 150.1 Results

Sample Type: Sample ID#:	LAN 000757	EAN 000768	LAN 0007 <b>69</b>	LAN 000770	DET 999999
Compound	Concentration mg/L				
Total Dissolved Solids	140	120	130	160	
Detection limit factor:	1.00	1.00	1.00	1.00	
Analysis started:	11/14/85	11/14/86	11/14/86	11/14/85	

Herbylrichect Mather AFB November 1985

Table 1. Analysis Type: 150.1 Results

Sample Type: Sample ID#:	LAN 000771	LAN 000772	LAN 000773	LAN 000774	DET 999999
Compound	Concentration mg/L				******
Total Dissolved Solids	120	11	210	150	19
Detection limit factor:	1.00	1.00	1.00	1.00	
Analysis started:	11/15/86	11/15/86	11/15/86	11/15/86	

merovirontent Mather HFS November 1985

Table 1. Analysis Type: 150.1 Results

Sample T.pe: Sample ID#:	LAN **	LAN 000776	LAN 000777	LAN 000778	DET 999999
Compound					
Total Dissolved Solids	140	190	ND	120	1.2
Detection limit factor:	1.00	1.00	1.00	1.00	
Analysis started:	11/17/86	11/15/86	11/15/86	11/17/85	

ND - not detected at detection limit times factor Note: Sample 000775 received on 11/17/86

* Data invalid, holding time exceeded

HerolingThent Mather AFE November 1985

Table 1. Analysis Type: 150.1 Results

Sample T.pe: Sample ID#:	LAN 000779	LAN 000780	LAN 000781	LAN 000783	DET 999999
Sampound					
Total Dissolved Solids	96	84	140	96	19
Detection limit factor:	1.00	1.00	1.00	1.00	
Analysis started:	11/17/86	11/17/86	11/17/86	11/17/85	

Aerovironment Mather AFB November 1985

Table 1. Analysis Type: 160.1 Results

Sample Type: Sample ID#:	LAN 0007 <b>84</b>	LAN 000785	LA <b>n</b> 000786	LAN 000787	DET 999999
Campound	Concentration mg/L				
Total Dissolved Solids	290	230	130	190	10
Detection limit factor:	1.00	1.00	1.00	1.00	
Analysis started:	11/17/86	11/17/86	11/17/86	11/17/86	

Herovironment Mather AFE November 1985

lable 1. Analysis Type: 160.1 Results

Sample Type: Sample ID#:	LAN 000788	LAN 000789	LAN 000790	LA <b>N</b> 000791	DE T 999999	
Campound	Concentration mg/L					
Total Dissolved Solids	130	730	100	100	19	
Detection limit factor:	1.00	1.00	1.00	1.00		
Analysis started:	11/17/86	11/17/86	11/18/86	11/18/86		

Aerovironment Mather AFE November 1985

Table 1. Analysis Type: 150.1 Results

Sample Type: Sample ID#:	LAN 000792	LAN 000793	LAN 000794	LAN 000795	DET papes s
Jompound		Cance	entration mo	]/L	
Total Dissolved Solids	890	420	150	120	19
Detection limit factor:	1.00	1.00	1.00	1.00	
Analysis started:	11/18/86	11/19/86	11/18/86	11/19/86	

Herbylronsent Mather AFB November 1985

Table 1. Analysis Type: 150.1 Results

Sample Type: Sample ID#:	LAN 000795	LAN 000797	LAN **	LAN *	DET 999999
Compound		Conce	entration mg	/L	
Total Dissolved Solids	390	420	250 q	250 a	17
Detection limit factor:	1.00	1.00	1.00	1.00	
Analysis started:	11/19/86	11/19/86	11/21/86	11/21/86	

ND - not detected at detection limit times factor q - Sample originally ran on 11/19/86 on nitric acid preserved aliquot due to laboratory error.

* Data invalid, holding time exceeded

Aerovironment Mather AFB November 1955

Table 1. Analysis Type: 160.1 Results

Sample Type: Sample ID#:	LAN *	LAN 000801	DET 99999
Compound	Co	ncentration	mg/L
Total Dissolved Solids	220 6	מא ב	10
Detection limit factor:	1.00	1.00	
Analysis started:	11/21/85	11/19/86	

ND - not detected at detection limit times factor  $q \sim Sample$  originally ran on 11/19/86 on nitric acid preserved aliquot due to laboratory error.

* Data invalid, holding time exceeded

Aerovirontent Mather AFS November 1985

Table 2. Analysis Type: 150.1 QA

Sample T.pe: Sample ID#:	MB1 999998	MB2 999999	MB3 999998	<b>MB4</b> 999999	DET 290000
Compound		Canc	entration mo	3/L	
Total Dissolved Solids	ND	ND	ND	ND	1.
Detection limit factor:	1.00	1.00	1.00	1.00	
Analysis started:	11/12/96	11/13/86	11/14/96	11/15/85	

Aerovironment Mather AFB November 1985

Table 2. Analysis Type: 150.1 QA

Sample Type: Sample ID#:	MB1 999998	MB2 999998	MB3 999998	MB4 999999	DE 7 999969
Compound		Conc	entration mo	3/L	
Total Dissolved Solids	ND	ND	ND	ND	19
Detection limit factor:	1.00	1.00	1.00	1.00	
Analysis started:	11/17/86	11/18/86	11/19/86	11/21/86	

Herovironment Mather AFB November 1985

Table 2. Analysis Type: 150.1 QA

Sample Type: Sample ID#:	LDU 000762	LDU 000757	LDU 000772	<b>∟D⊍</b> ⊍00078 <b>7</b>	)E7 900090
Campaund		Conce	entration mo	<b>j</b> /L	
Total Dissolved Solids	130	120	ND	590	
Detection limit factor:	1.00	1.00	1.00	1.00	
Analysis started:	11/13/85	11/14/86	11/15/96	11/17-86	

ND - not detected at detection limit times factor

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Herbylingnaent Mather HFB November 1995

Table 2. Analysis Type: 160.1 QA

Sample T.pe: Sample 10#:	LDU 000 <b>8</b> 01	LSP 999997	DET 99999			
Compound	Concentration mg/L					
Total Dissolved Solids	ND	94 +	10			
Detection limit factor:	1.00	1.00				
Analysis started:	11/19/35	11/19/86				

ND - not detected at detection limit times factor * - percent recovery of Quality Control sample 9903 (1090 mg TDS/c)



Energy & Environmental Division

December 18, 1986

AeroVironment, Inc. 825 Myrtle Avenue Monrovia, CA 91016

Attention: Chris Lovdahl

Subject:

Analysis of Mather Air Force Base Samples

Samples were analyzed by gravimetric measurement for total dissolved solids using EPA method 160.1. The results are presented in Table 1 with QA results in Table 2.

Prepared by:

/ Rommeo M. Milanes

**Themist** 

) approved by:

Greg Njeoll

Manager, Inorganic Chemistry

Herovoromie i Mather HPB December 1 Be

Table 1. Analysis Type: 150.1 Sesuits

Sample T.pe: Sample ID#:	CHN 000801	LAN 000502	LAN 000503	<del>-</del> · · ·	[E*	
มีอ <b>ตอ</b> อนก <b>ป</b>	Concentration mg/L					
Total Dissolved Solids	150	98	::0	130		
Detection limit factor:	1.00	1.00	1.00	1.00		
Analysis stanted:	12/10/36	12/09/86	12/09/88	12/09/36		

Herovirontest Mather HEE December 1983

Table 1. Analysis Type: 180.1 Results

Bample T.pe: Bample ID#:	LAN 000605	LAN 000505	LAN 000507	LAN 100508	[ET popses		
Compound	Contentration mg/L						
Total Dissolved Solids	117	140	190	19.	1		
Detection limit factor:	1.00	1.00	1.00	1.90			
Analysis started:	12-10/85	12/19/85	12/10/85	12/10/95			

Herovinostans Mather Aff December 1965

Table 1. Analysis Type: 1:0.1 Results

Bample ID#:		1AN 090519						
lampaund	Concentration mg L							
Total Dissolved Bolids	110	269	95	77	1.			
Tetection limit factor:	1.00	1.00	1.00	1.00				
Analysis started:	12/10/85	12/13/85	12-10-35	12, 19/36				

Harovirontern Mather HFS December 1985

Table 1. Analysis Type: 160.1 Results

Bample T.pe: Bample IO#:	LAN 000613	LAN 000614	24 <b>N</b> 000615	14N 009515	[ET 553435
Conpaund		Conci	entration m	<b>3</b> /L	
Total Dissolved Solids	98	560	100	170	
Detection limit factor:	1.00	1.00	1.00	1.00	
Analysis started:	12/10/85	12/10/85	12/12/86	12/11/86	

Hanskinstrant Mathan 455 December 1965

Table 1. Analysis Type: 150.1 Results

Sample Type: Sample ID#:	LAN 000617	LAN 000618	2AN 91400c	EAN 000 <b>52</b> 0	557 93998		
Dompound	Concentration mg/L						
Total Dissolved Bolids	170	48	1500	52			
Setection limit factor:	1.00	1.90	1.00	1.00			
Analysis started:	12/11/86	12/11/85	12/12/86	12/11/85			

Heri..rootern Mather H^SB December 1985

Table 1. Analysis Type: 150.1 Results

Bamble T.pe: Bamble ID#:	LHN 000621	<del>-</del>	LAN 009523	<del>-</del>	DET 434333	
is append	Concentration mg/L					
Total Dissolved Solids	150	91	140	180		
Detection limit factor:	1.00	1.00	1.00	1.40		
Analysis started:	12/11/86	12/11/86	12/11/98	12/11/86		

Heno increas Mather 499 Dacember 1985

Table 1. Analysis Type: 157.1 Sesuits

Bamble Tube: Bamble ID#:	·-	LHM 000525	_	LAN 30.3513	0E* 540000		
Iompourd	Concentration ag L						
Total Dissolved Solids	120	150	170	130			
Tetestion .imit factor:	1.00	1.00	1.10	1.00			
Hoalvais started:	12 11 85	12 11/98	12/11 95	12/11 85			

Hend Unitine in Mathem HES December HES

Table 1. Analysis Type: 160.1 Results

Sample fine: Sample 10#:		LAN 200633		LAN 000aTI	[27 232371		
lampound	Concentration mg L						
Total Dissolved Solids	<b>9</b> 0	95	730	350			
Detection limit ractor:	1.30	1.20	1.00	1.00			
Analysis startad:	12:11:85	12/12/95	12/12/85	12,12 35			

Hero Uroniani Mather HFS Jecesper Uros

Table 1. Analysis Type: 150.1 Results

Bample Type: Bample ID#:			_	LAN 000aJa	
Compound		Concentration m		3/-	
Total Dissolved Solids	<b>15</b> 0	170	140	NI NI	:
Detection limit factor:	1.00	1.00	1.20	1.90	
Analysis started:	12 12 36	.2/12/85	12/12/86	12/12 95	

Heroviconisco Mathemu-Pa December 1993

Table 1. Analysis Type: 160.1 Results

Bandle Tude: Bamole ID#:		LAN 000539	LAN 000617	£AN (00 <b>5</b> 4(	367 933333		
Ismaalnd	Concentration age L						
Tatal Dissolved Solids	300	78	780	100	:		
uetection limit factor:	1.00	1.00	1.00	1.00			
Apalysis started:	12/12/88	12/12/86	12/14/35	12/14/85			

NI - not detected at detection limit times factor

1

Hanguinin a n Mather H^{ag} December 1996

Table 1. Analysis Type: 150.1 Results

Panpie Type: Panpie IC#:	_HN 050€ <b>41</b>	_LAN 00 542		_#N 90 9 <b>54</b> 4	\$ = 3 \$ 1 ±		
lomopund	Concentration mg/L						
Total Dissolved Bolids	180	31	1::0		:		
Letection limit Factor:	1.00	1.00	1.00	1.70			
Analysis stanted:	12/14 95	12/14/86	12/14/85	12/14/85			

Hatter Har December

Table 1. Analysis Type: 150.1 Sesults

Sample (S#:				CAN 300543			
Danabund	Concentration may:						
Fotal Sissolved Solids	53	54	117		:		
Detection limit factor:	:.00	1.00	1.00	1.5			
Analysis started:	12/14/95	12/14/85	12/14/85	12 14 36			

Hang got tall Mathem Hall December 1988

Table 1. Analysis Type: 150.1 Results

Bample Type: Bample ID#:				_4N . :==I	32333
วิวตรอยกรั		Cance	entration m		
Total Dissolved Bolids	130	120	140	149	
Setection limit factor:	1.00	1.00	1.00	1.9.	
Analysis started:	12/15/86	12/15/86	12/15 35	12, 15, 25	

Harovinos A Mather HPP December 1995

Table 1. Healists Fiber 150.1 Results

Exhale Type: Exhale II#:		นส <b>ท</b> 3995 <b>54</b>			
lamodund		Sonce	intration mo	: L	*
Tital Dissilved Solids	120	110	53	190	:
Decestion limit mactor:	1.10	1.10	1.14	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
-talvava started;	12/15/95	12 15 86	12 15 85	12 15/35	

Herov norne: Mather HFS December (1995)

Table 1. Analysis Type: 160.1 Results

Sample Type: Sample 10#:	UAN 000 <b>5</b> 57	LAN 000 <b>658</b>	LAN 3006 <b>59</b>	LAN 000550	[E ^T :3:33:
Icappund		Conc	entration mo	g/L	
Total Otssolved Solids	120	210	210	ND	
Setestion limit factor:	1.00	1.00	1.00	1.00	
Analysis stanted:	12/15/96	12/15/85	12/15/36	12/15/86	

Hartviroonger Matham H93 Secender 1935

Table 1. Analysis Type: 150.1 Results

Sample Type:	i_−N - 00551	251 99999
2010:.70	Concentratio	n mg L
Total Dissolved Bolids	119	13

Abalysis started: 12 15 95

Hendyundonent Mathan 479 December 1995

Table 1. Analysis Type: 150.1 DA

Bample Yvoe: Bample ID#:	MB1 \$99999	482 999998	MB] 999999	ME4 9 <b>4</b> 9933	287 99993
Singquad		Conce	entration mo	3/4	
Total Gissolves Solids	ND	DN	ND	v9	:
Setection limit factor:	1.00	1.00	1.00	1.00	
Analysis started:	12/09/86	12/10/85	12/11/96	12/12/85	

Table L. Analysis Type: 150.1 QA

Eample Tipe: Sample IC#:	୴ <u>ଷ୍ଟ୍ର</u> ବ୍ୟବ୍ୟବୃଷ୍ଟ	अञ्चल्ह १९२०५६	ლე <b>ს</b> ტეტა1ტ		[ET 300531
Compound		Sance	entration n	 }/-	
Total Dissolved Solids	NC	ND	27)	140	:
Detection limit factor:	1.00	1.00	1.00	1.00	
Acalysis stanted:	12/14/35	12/15/88	12/10/95	12/11/85	

hD - not detected at detection limit times factor

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Henokunonne Mathen AFB December 1785

Table 1. Analysis Type: 157.1 04

Earcle Type: Earole 13#:			LDU 000545	<b>.30</b> ) ya <b>s</b> û	287 499555
upnab/nd		Canc	entration m	3 . <del>-</del>	
Total Cissolved Eclics	CN	5.7	71)	NJ	:
Cetestion limit factor:	1.30	1.00	1.00	1.00	
Analyais stanted:	12:12/85	12/14/95	12/14/85	12/15/88	

### HAZARDOUS WASTE TESTING LABORATORY CERTIFICATION LIST

HAZARDOUS MATERIALS LABORATORY SECTION CALIFORNIA DEPARTMENT OF HEALTH SERVICES 2151 BERKELEY WAY, BERKELEY, CALIFORNIA 94704 06/06/86

Acurex Corporation CERTIFICATE NO: 125 555 Clyde Avenue P.O. Box 7555 Mountain View, CA 94039 LAB CATEGORY: Commercial PHONE : (415)964-3200 DATE CERTIFIED: 06/06/86 ORGANIC CHEMICAL TESTING (Y = CERTIFIED, N = NOT CERTIFIED) 1.4 Halogenated Volatile Organics -----Y 1.5 Polychlorinated Biphenyls (PCBs)-----Y 1.6 Carbamates 1.7 GC/MS Method for Semivolatile Organics (B/N/A)-----Y 1.8 Non-Halogenated Volatile Organics -----Y 1.10 Acrolein, Acrylonitrile, Acetonitrile ------Y 1.12 Nitroaromatics and Cyclic Ketones -----Y 1.13 Polynuclear Aromatic Hydrocarbons -----Y 1.14 Chlorinated Hydrocarbons ------Y 1.15 Organophorus Pesticides -----Y 1.16 Volatile Organics by Mass Spectrometry------Y INORGANIC AND OTHER TESTING (Y = CERTIFIED, N = NOT CERTIFIED) 2.1 Antimony -----Y NON-METALLIC 2.2 Arsenic -----Y 2.19 Cyanide -----Y Bartum -----Y 2.3 Beryllium ----Y 2.20 Fluoride -----Y 2.4 2.21 Sulfide -----N Cadmitum -----Y 2.5 2.6 Chromium(VI) -----Y 2.7 Chromium(total) -----Y 2.8 Cobalt -----Y 2.9 Copper -----Y 2.10 Lead ----Y OTHER 2.11 Mercury -----Y 2.12 Molybdenum -----Y 3.0 Bulk Asbestos Testing ----N 2.13 Nickel -----Y 2.14 Selenium -----Y 4.0 Physical Property Testing -N 2.15 Silver -----Y 2.16 Thallium -----Y 5.0 Aquatic Toxicity Testing --N 2.17 Vanadium -----Y 2.18 Inc -----Y 5.0 CA Waste Extraction Test --Y

# Anion/Cation Balance Data

NE Perimeter
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## Shallow Wells

NE Fermieter						
			<del>-</del>	AMS PER LI ENTS PER L	-	
STATION NAME OF NUMBER	MG	CA	NA+F	CO3+ HCO3	S04	CL
DH73G1	4.30 0.35	 9.10 0.45	13.40 0.56	100.00 1.64	12.00 0.25	3.70 0.10
DH75G1	6.10 0.50	11.00	10.70 0.44	42.00	6.80 0.14	4.90 0.14
DH/aG1	6.50 0.53	13.00 0.65	9.96 0.42	<b>49.</b> 00 0.80		
				Deep Wells		
DH64G1	6.15 6.01	2.10	36.70 1.53	57.00 1.24	29.00 0.60	6.40 0.18
DH65G1	3.40 0.28	8.70 0.43	18.80 0.79	60.00 0.98	15.00 0.31	7.30 0.21
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DH48G1	<b>5.5</b> 0	15.00	9.96	49.00	5.30	11.00			
	0.53	0.65	0.42	0.80	0.97	0.71			
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**APPENDIX H** 

References

#### H. REFERENCES

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### APPENDIX I

## Professional Resumes

S. Eccker
P. Herrera
C. Lovdahi
K. Napp
T. O'Gara
K. Pettus
D. Taylor
S. Thurston

I

## RESUME

Sandra Eccker Geochemist Earth Sciences Section Environmental Measurements Department Environmental Programs Division AeroVironment Inc.

#### Technical Specialties

Soil Gas Sampling
Gas Chromatography
Water Quality Analysis
Remote Sensing
Colorimetric Spectroscopy

### Professional Experience

Ms. Eccker is a geochemist at AeroVironment, where she specializes in investigations of hazardous waste contamination in soil, water, and vadose zone. She is an expert in soil gas sampling and analysis using a portable gas chromatograph to delineate the type, source, and extent of contamination. Based on this field work she is able to specify locations where soil should be removed or monitoring wells installed. In her previous employment with Keck Consulting Services she also pursued this problem of hazardous waste contamination.

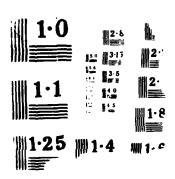
In earlier work for Resource Consultants, she provided the U.S. Army Corps of Engineers with litigation support in the Rocky Mountain Arsenal's groundwater contamination suit against Shell Oil. This involved investigating and documenting the history and development of the contamination problem by reconstructing the history of lease agreements, chemical manufacturing operations, and methods and locations of waste disposal at the site. In work for the Forest Service, she evaluated remote sensing techniques, including infrared aerial photographs, for use in pest management.

At Chevron Oil, Ms. Eccker worked extensively with a Hewlett Packard 5840 gas chromatograph to improve its analytical performance. She then rebuilt and tested the response of its flame ionization detector. To complete the study, she wrote a design and operation manual for the HP5840.

#### Education

M.S., Geology, Colorado State University, 1984 B.A., Chemistry, Smith College, 1980

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## RESUME

Paul D. Herrera Environmental Scientist/Engineer Environmental Analysis and Modeling Department AeroVironment Inc.

### Technical Specialties

Computer Graphics
Data Reduction and Statistics
Air Quality, Water Quality and Visibility Data Analysis

### Professional Experience

Mr. Herrera analyzes a wide variety of air quality data, from visual range to point measurements. This analysis entails the use of computer graphics interpreted by developing software capable of reducing the data and providing pertinent statistical information. He also works with the Hazardous Waste Group. He is experienced in designing, logging, developing and sampling groundwater monitoring wells. In addition, he has been trained in taking soil samples with a hollow-stem auger, using the "California-" or "Ring-" type sampler.

Before working for AeroVironment, Mr. Herrera was employed by the National Oceanic Atmospheric Administration as an environmental scientist/engineer. There he participated in field and research projects. Some of his duties were to collect air and water samples, to organize incoming data, and to perform programming and analysis. He was also involved in such research fields as atmospheric chemistry, water chemistry and air toxics.

### Education

B.S., Environmental Science/Engineering, New Mexico Highlands University, 1986

#### Professional Affiliation

Air Pollution Control Association, Member Pollution Engineering, Member ACM, Member

# RESUME

Christopher W. Lovdahl
Environmental Chemist
Environmental Programs Division
AeroVironment Inc.

### Technical Specialties

Analytical Chemistry Environmental Chemistry Hazardous Materials Handling

### Professional Experience

Mr. Lovdahl provides chemistry support to projects related to hazardous waste handling, environmental compliance and site evaluation. He has conducted three site visits as part of a large project to audit environmental compliance of 11 U.S. Air Force manufacturing plants. Besides reviewing applicable regulations for hazardous waste generation, storage and disposal, he also assessed risks from underground storage tanks and evaluated waste minimization alternatives at the plants. In a waste inventory program for a research facility in the state of Washington, he helped prepare a wastehandling manual, identified disposal alternatives and collected high concentration drum samples.

Mr. Lovdahl is a key member of AeroVironment's Installation Restoration Program project team. He is responsible for most chemistry aspects of the site characterization and sampling activities, including sampling plan preparation, coordinating laboratory functions and conducting laboratory system and performance audits. Having an extensive background in laboratory quality assurance/quality control, Mr. Lovdahl reviews all analytical data, and evaluates field QC sample data as part of AeroVironment's QA/QC program.

In his previous position with the Cadillac Motor Car Division of General Motors, Mr. Lovdahl was an analytical chemist responsible for analysis of water and hazardous waste samples using spectrophotometry, atomic emission spectroscopy, GC (ECD,FID), GC/MS, ICP and HPLC. All environmental lab work was conducted according to established EPA procedures and QA/QC protocols. As part of his lab position, he worked with plant personnel to assure that proper sampling methods were used for water and wastes to be analyzed in the laboratory. Before joining the laboratory staff, Mr. Lovdahl served as an associate engineer for toxic/hazardous materials management at Cadillac. In that position, he was responsible for

developing, implementing and maintaining hazardous waste management programs at three manufacturing plants. This work included waste sampling, identification of hazardous waste generation, implementation of handling procedures and approval of RCRA TSD facilities used for disposal of Cadillac's wastes.

Mr. Lovdahl has also worked for Great Lakes Environmental Services, where he coordinated three large laboratory chemical disposal projects. He was also involved in plant environmental surveys that included sampling, determination of necessary analytical testing, permitting and reporting. In another phase of that project, Mr. Lovdahl evaluated client facilities for compliance with hazardous waste, wastewater and spill control regulations.

#### Education

B.S., Environmental Science, University of Michigan, Dearborn, 1980

### Professional Memberships

American Chemical Society

# **RESUME**

Kenneth F. Napp Associate Hydrogeologist Earth Sciences Section Environmental Measurements Department Environmental Programs Division

### Technical Specialties

Water well inspection and design Groundwater/vadose monitoring Fluvial geomorphology and sedimentology Soil analysis and characterization Sampling protocols RCRA regulations and UST standards

### Professional Experience

Since joining AV, Mr. Napp has primarily been involved in AV's Installation Restoration Program projects with the U.S. Air Force. His responsibilities include design, placement and lithologic logging of water wells, drilling supervision, groundwater sampling, interpretation of geophysical logs and writing of reports. He is also involved in underground storage tank (UST) investigation, compliance programs and site assessment. His duties include supervision of UST precision integrity tests, tank and pipe excavating and design and placement of vadose and groundwater monitoring wells. These tasks require fluency in California state, county and local UST standards.

Prior to joining AV, Mr. Napp provided consulting services to the oil and gas industry in Denver, Colorado. He specialized in correlating surface and subsurface sandstone mineralogy, porosity, petroleum potential, and diagenetic history of Cretaceous and Permian oil-bearing strata.

#### Education

M.S., Geology, Colorado State University, 1985
B.S., Geology, State University of New York at Albany, 1981
CSU continuing education courses:
Groundwater Engineering, 1986
Solutions to Groundwater Problems, 1986

# **RESUME**

Timothy F. O'Gara Hydrogeologist Field Operations AeroVironment Inc.

### Technical Specialties

Hazardous Waste Investigations Groundwater Monitoring Water Supply Well Design and Inspection

### Professional Experience

Mr. O'Gara is a hydrogeologist in the Environmental Programs Division at AeroVironment. In this capacity, he provides key support to AV's hazardous waste projects. He has served as field team leader on site investigations for various corporate and government clients. These investigations have included installation of numerious ground water monitoring wells and continuous soil sampling to depths of 80 feet. He has been responsible for field portions of investigations at several bases in the western U.S. under an Installation Resoration Program contract for the U.S. Air Force. For these programs, he has written and implemented soil and water sampling procedures, designed and installed ground water monitoring wells, and served as the procedures, designed and installed ground water monitoring wells, and served as the procedures designed and installed ground water monitoring wells, and served as the procedures designed and installed ground water monitoring wells, and served as the procedures designed and installed ground water monitoring wells, and served as the procedures designed and installed ground water monitoring wells, and served as the procedures designed and installed ground water monitoring wells, and served as the procedures designed and installed ground water monitoring wells, and served as the procedures designed and installed ground water monitoring wells.

As a member of AeroVironment's hazardous waste investigation team, Mr. O'Gara has received training in EPA methods for soil and water sampling, as well as for site safety and respiratory protection.

Before joining AV, Mr. O'Gara was self-employed as a contracting hydrogeologist. During this time, he provided specialized hydrology and geology consulting to several consulting firms in Southern California. He directed drilling and soil sampling programs for numerous leaking underground storage tank investigations at facilities in the Los Angeles area. These programs were conducted in accordance with the guidelines adopted by the California Regional Water Quality Control Board. His responsibilities included insuring that proper safety, sampling protocol, and chain of custody procedures were followed throughout the investigation. He was also responsible for selecting the test boring sites. In other consulting work, he provided design and on-site inspection for groundwater projects as diverse as municipal water supply wells and multiple completion piezometer networks.

In previous employment by James M. Montgomery Consulting Engineers (JMM), Mr. O'Gara served as the resident geologist at the initial closure of the Stringfellow Quarry Class I hazardous waste site. In that capacity, he supervised the placement of the subsurface containment barrier, the installation of downgradient monitoring wells, and the monitoring of groundwater conditions during the construction. Other assignments included field inspection for extension of the Alamitos Injection Well Salinity Barrier for Orange County Water District, installation of various piezometer networks, and performance of isolated zone tests in deep wells. The latter projects helped to determine the water quality of specific aquifers within multiple aquifer systems.

### Education

B.A., Earth Science, California State University, Fullerton, 1980

### Professional Affiliations

National Water Well Association, Association of Ground Water Scientists and Engineers

# RESUME

Keith J. Pettus
Manager, Quality Assurance Department
AeroVironment Inc.

#### Technical Specialties

Air Quality Instrumentation Air Chemistry

#### Professional Experience

Mr. Pettus manages air monitoring data quality assurance on AeroVironment's air quality, meteorology, and visibility measurement programs. His activities include instrument calibration, instrument audits, data validation, and statistical analysis of data quality. He currently oversees the internal QC functions of two visibility monitoring stations which AV operates in Arizona for the Electric Power Research Institute. He is also providing external quality assurance assistance to Salt River Projects air quality monitoring stations near its Navajo generating station. Recently, he was assistant quality assurance for the EPA-sponsored PEPE/NEROS study. AV provided quality assurance for the entire project, which involved the interaction of many organizations in taking a complex series of intensive ground-band and airborne measurements. He has also managed an audit program for that air quality monitoring sites near Tucson, Arizona.

Before joining AeroVironment, Mr. Pettus was an air pollution instrument technician with the South Coast Air Quality Management District. His duties included instrument maintenance, data reduction, data reporting, and some instrument repair.

Mr. Pettus was a Postgraduate Research Chemist at the Statewide Air Pollution Research Center on U.C. Riverside's campus, where he was involved with instrument calibration, instrument repair, data collection, data validation, chemical and biological experimentation and analysis of environmental samples. His projects included formation and characterization of nitrosamines and nitrobenzo-A-pyrenes, and studies on diesel fuels and jet plane exhaust for the Air Force. Among instruments he used were the NMR and IR spectrometers.

#### Education

B.S., Chemistry, University of California, Riverside, 1977
U.S. EPA Air Pollution Training Institute Course, Quality Assurance for Air Pollution Measurement Systems

#### Professional Memberships

Air Pollution Control Association

# **RESUME**

Douglas B. Taylor, P.E. Project Manager Hazardous Waste Projects Group Environmental Programs Division AeroVironment Inc.

#### Technical Specialties

Hazardous Waste Management Waste Site Characterization Wastewater Treatment

#### Professional Experience

Mr. Taylor serves as a key project manager in the Hazardous Waste Program for AeroVironment. In this capacity he is responsible for field activities, project planning in the learning input schedule and budget control and team management. The is care into input schedule and budget control and team management. The is care into including a level-of-effort Air Force contract related to the installation despitation Program for assessing and investigating hazardies waste at the introduction potential soil and groundwater contamination at Air Force bases in the western United States, resulting from leaking tanks and poor waste management. Mr. Taylor also manages and provides technical support to environmental audits, waste inventories, and private property site characterizations. He also serves as corporate health and safety officer.

Mr. Taylor previously worked for Ecology and Environment Inc. as the group leader for preliminary assessments and site inspections on the EPA's field investigation team contract in Denver, Colorado. As group leader, he managed routine assignments, including site inspections, sampling projects and impact assessments at over 50 sites in EPA Regions 3 and 8. He has prepared engineering reports for EPA sites including a remedial investigation plan for the McAdoo Drum site in Pennsylvania, a cost estimate report for slag isolation in Philadelphia, and a delisting analysis for a National Priority List site in Utah. Additional specialized work included managing several geotechnical/hydrological drilling projects and drum opening activities.

Mr. Taylor also worked on a variety of water quality and hazardous waste related projects for D'Appolonia Consultants. He was the principal engineer in the investigation of a toxic waste impoundment at the Rocky Mountain Arsenal in Denver. For the Strategic Petroleum Reserve, he provided water quality studies and investigated treatment alternatives for raw water used in the expansion of salt caverns.

#### Education

M. Engr., Environmental Engineering, Pennsylvania State University, 1980

B.S., Environmental Engineering, Pennsylvania State University, 1979

#### Registration

Professional Engineer, Colorado and California

#### Professional Memberships

American Society of Civil Engineers American Water Works Association Chi Epsilon Water Pollution Control Federation

# RESUME

Sheryl Thurston
Environmental Engineer
Environmental Programs Division
AeroVironment Inc.

#### Technical Specialties

Waste Site Evaluation Environmental Compliance Impact Assessment

#### Professional Experience

Ms. Thurston serves as an engineer supporting AeroVironment projects in the areas of regulatory compliance, air toxics problems and waste site investigation projects for the U. S. Air Force. She is currently working on two site investigations: Beale AFB and Mather AFB, which are being investigated to evaluate possible contamination from fuel spills, storage tank leaks, landfills and poor waste handling. Ms. Thurston's responsibilities include collecting soil samples with hollow stem auger equipment, monitoring and logging cuttings from well-drilling operations, and designing and developing groundwater monitoring wells. Ms. Thurston has also worked on environmental compliance audits at Air Force manufacturing facilities. She was responsible for background research and report writing.

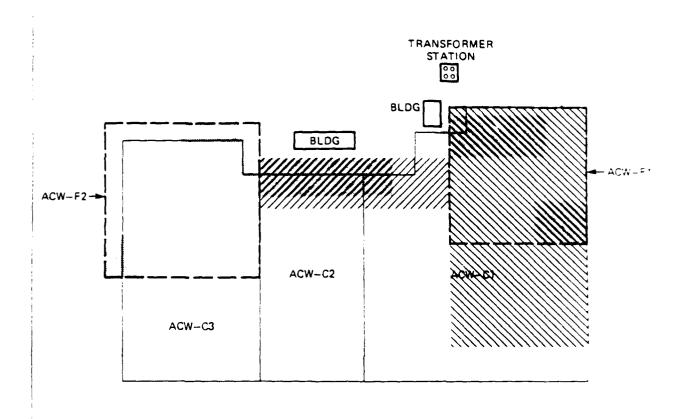
Prior to working for AV, Ms. Thurston served as a summer intern with the Rhode Island Department of Environmental Management (DEM). While with DEM, she conducted research and prepared an annual report on hazardous waste management in Rhode Island, which was submitted to the EPA. She also participated in RCRA groundwater testing and inspection of hazardous waste generators, transporters and storage sites within the state.

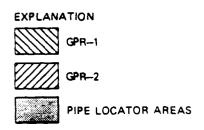
#### Education

B.S., Environmental Engineering, Northwestern University, Evanston, IL, 1985

# APPENDIX J

Geophysical Surveys, Data and Maps



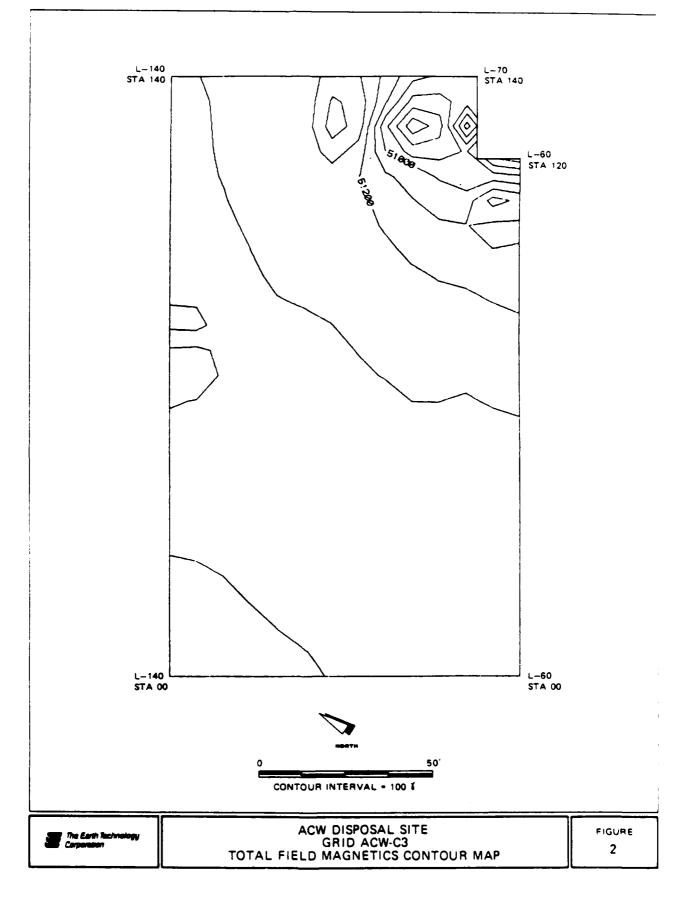


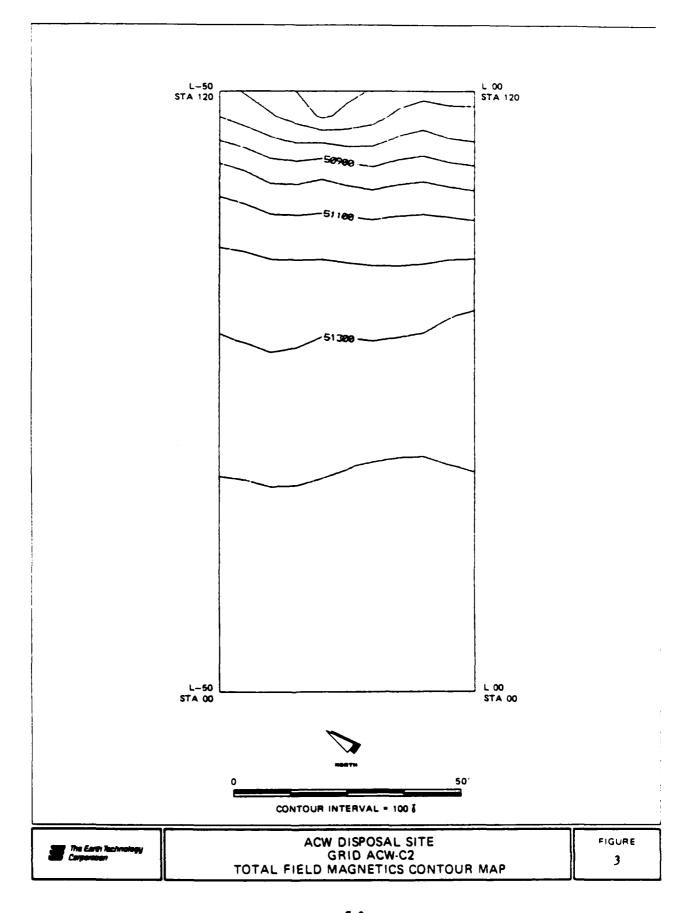
ACW DISPOSAL SITE

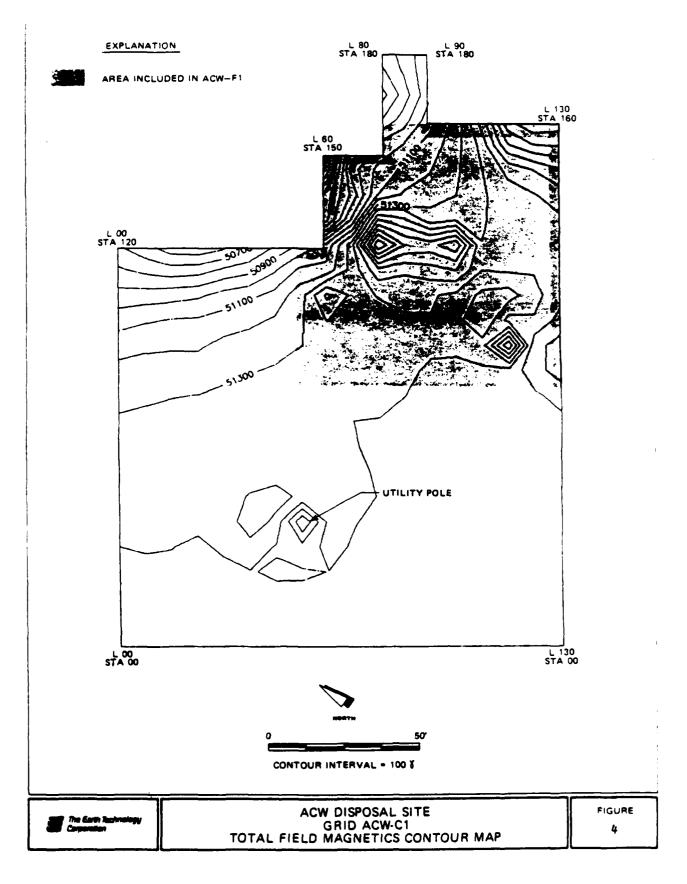
GPR AND PIPE LOCATOR LOCATION MAP

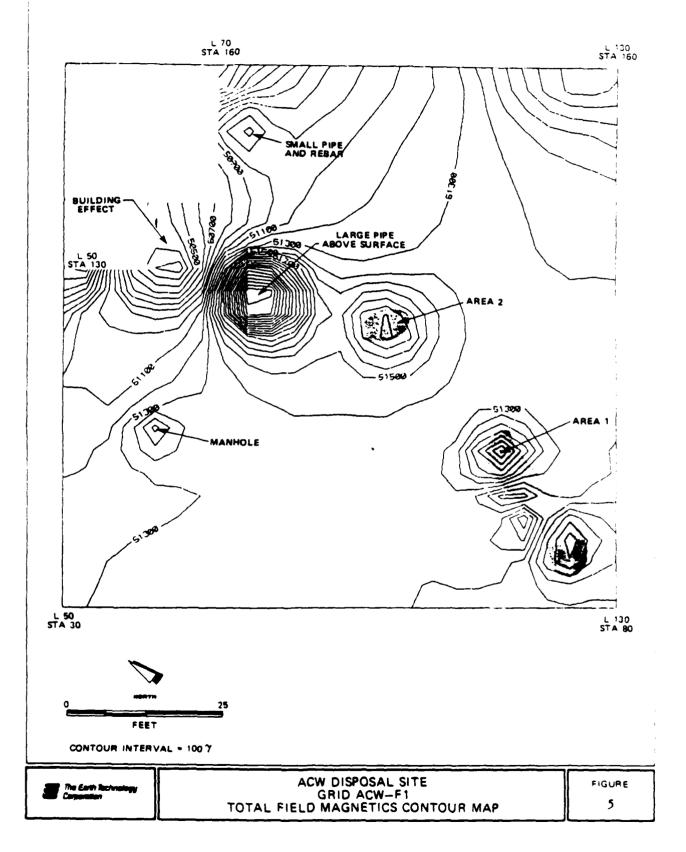
FIGURE

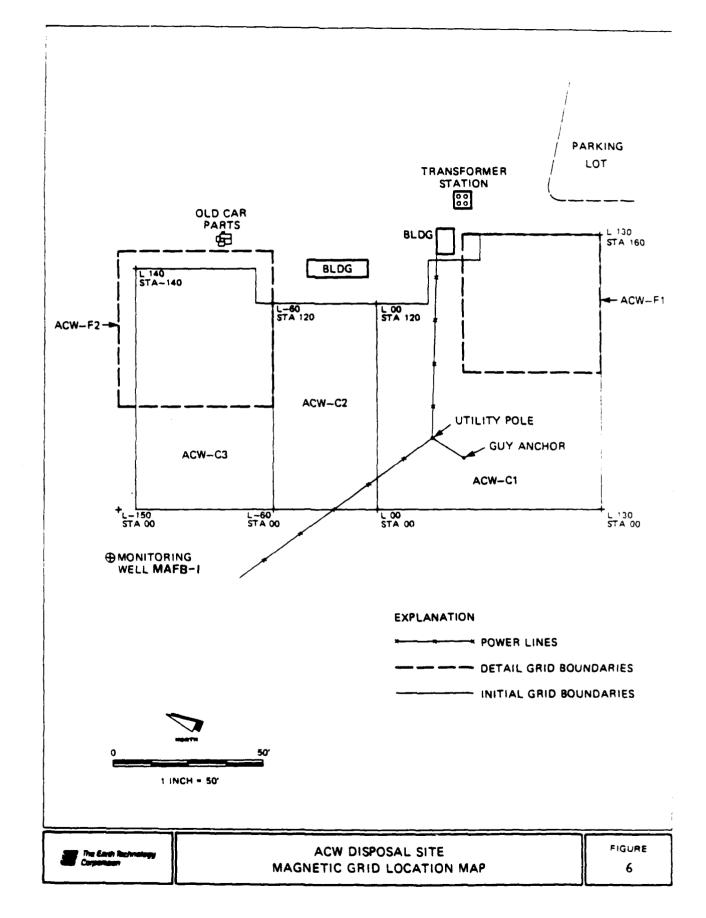
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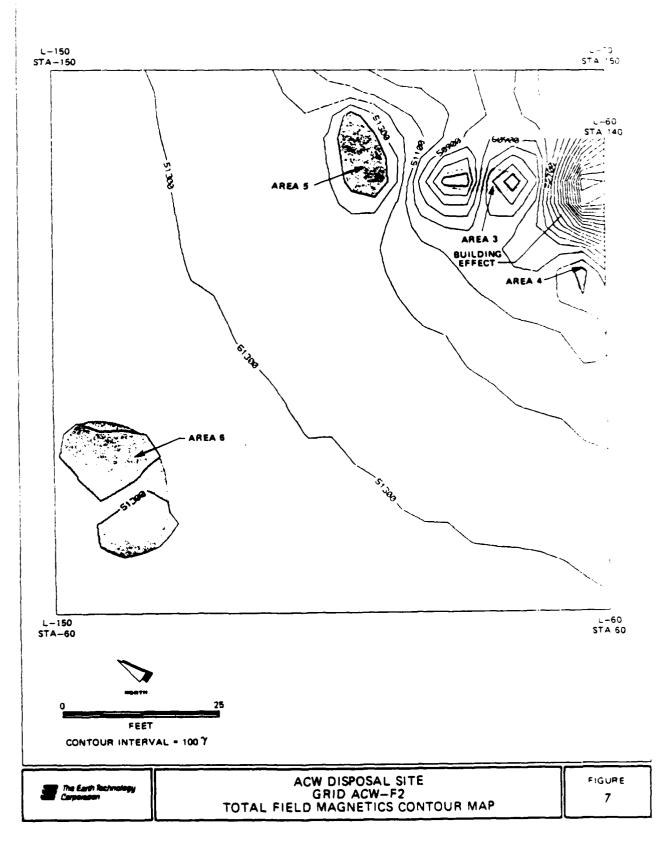


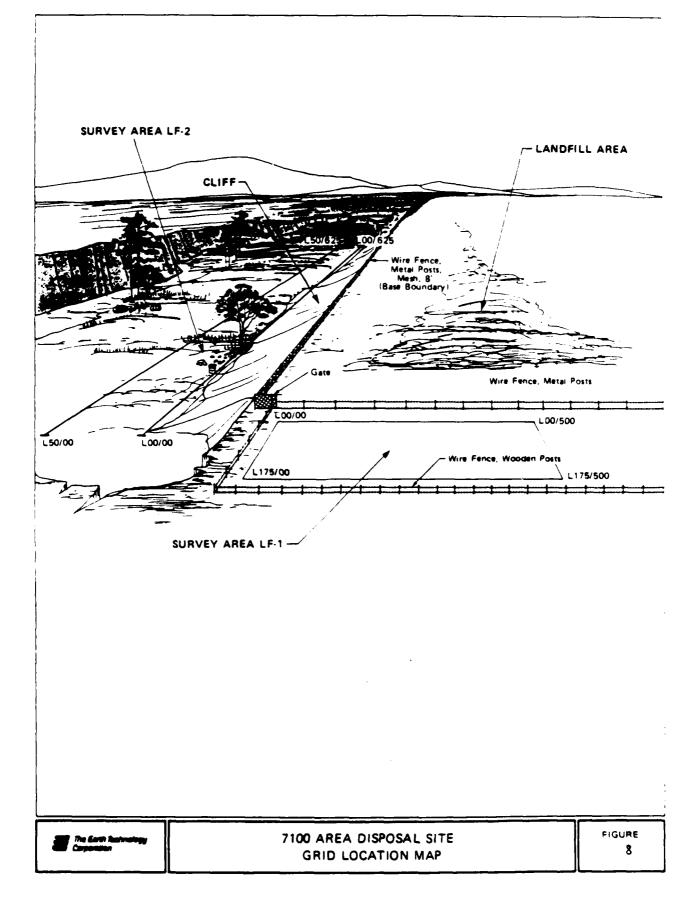


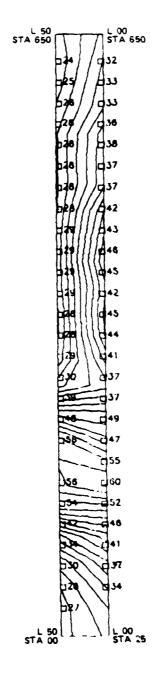


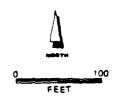








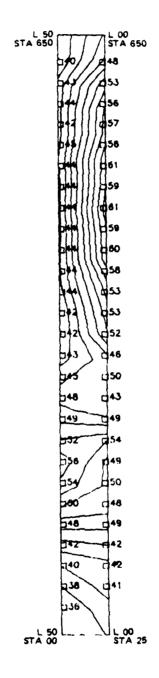




CONTOUR INTERVAL = 2mmhowm

The Earth Rechnology Corporation 7100 AREA DISPOSAL SITE GRID LF-2 EM-34: 10 METER SEPARATION

FIGURE 9

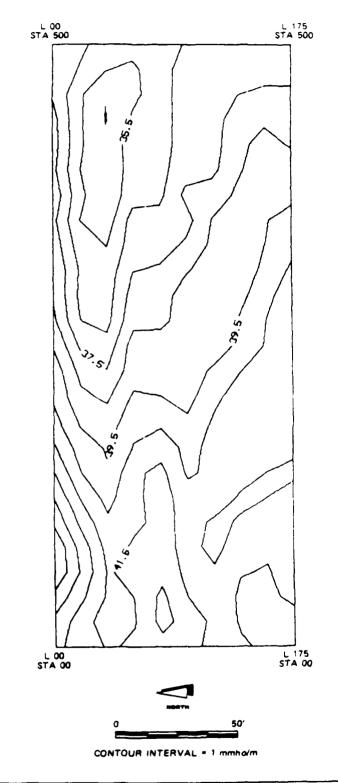




CONTOUR INTERVAL = 2mmhos/m

The Earth Rechnology Corporator 7100 AREA DISPOSAL SITE GRID LF-2 FM-34: 20 METER SEPARATION

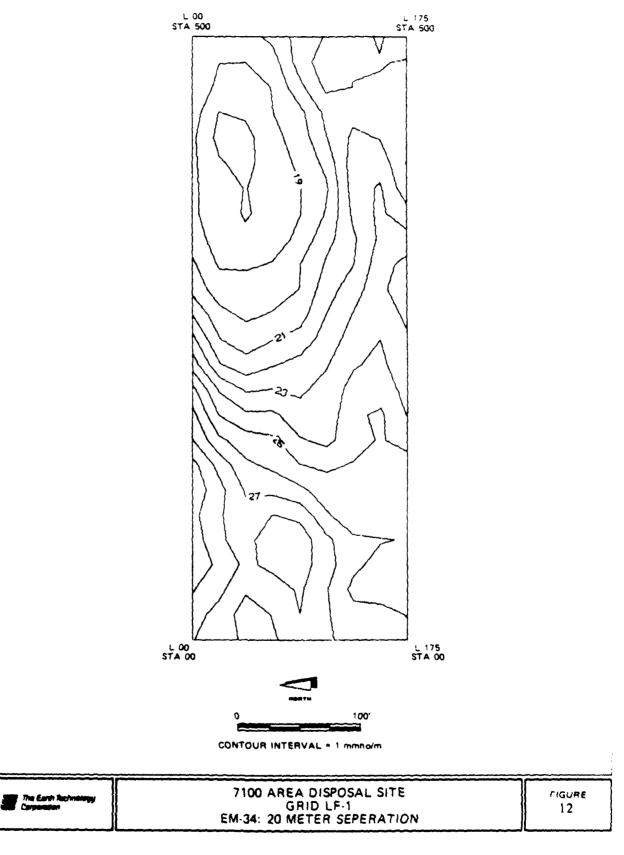
FIGURE 10

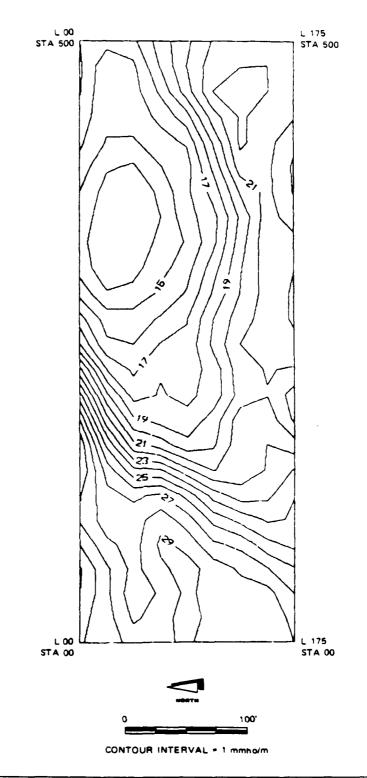


7100 AREA DISPOSAL SITE

GRID LF-1

EM-34: 40 METER SEPARATION





GRID LF-1 EM-34: 10 METER SEPERATION
--------------------------------------

APPENDIX K

Site Safety Plan

:

#### AEROVIRONMENT INC.

Hazardous Waste Project Site Safety Plan*

Name of Site ///ATMC1 4573	·
Address of Site 12 miles GAST OF S	ACRAMENTO CA
Client USAFOGHL (CAM. CRAN M	Project No. 10416 -
Client's Site Contact CAPT. IAMES CUR	RAL
Plan Prepared By Tim Stim Digara	Date_6.27-r1
Plan Reviewed By (AV) Doctor	Date
Plan Approved By (Med-Tox)	Date
Overall Objective of Site Visit Eccord	W MUGSTICATION TO EVALUATE T 200
SIL THE ARE KLANT TO 130 CONTACT.	AIRS. IBS. FIGURE WORK IT
NURTHERST PERIMETER AND WATER	L SAMPLING FROM BASE WELLS
12 ALTH PLACE D	
Proposed Date(s) of Site Visit = 36	1986 ـ الح
US 1 F,	INTERVAL DOCUMENTS DEUS SYTE
Source of Information on the Site $xn^p$	RESERRCH, SAMPLIUS AND DRILLIAMS
How Old is Information?	) 141 1985. A SUMMARY OF PREVIOUS 15 -
S SHOWN IN ATTACHMENT I.	Madium // Law
Overall Hazard EstimationHigh	
BUT OWN IN PPB RANGEAUD NO OR	TAGE   SHOWS WATER COUTHING SERVEY
Physical Description of the Facility (attac	h map) 5798 ACRES IN SACRIMENT
LALLEY 12 MILES GAST OF DULL	NETOWN SALRAMENCE. STE MICHOLD
PRINCIP SHOPS HOWER STOR MY	O MUCH CPGL AREA
Operational Description of the Facility TA	IE BASE IS PRIMARILY USED FUR
MANICATURE TRAINING. WE WILL B	& INVESTIGATIVE A WASTE DISPOSAL AREA
IN ALD LANDEILL, A DRAINAGE DAW,	ALID WILL BE PLACING UP-GRADIE
WELLS , LAME FIRE WORTH GAST I	
Site Status:ActiveClosed	AbandonedUnknown
AV-F-HSO7a * This is The PLA	IN SPECIFIC FUR THIS PROJEC
Si 15 Supplement	TED 34 THE CERPORATE HOALTH AUD
SHALL TERMS	ACROVIROLIMENT SUC. (SEE ATTACHMENT 2).

List	the	Waste	(s) of	Concern:
------	-----	-------	--------	----------

Waste	Physical State	<u>Characteristics</u>
SOLVENTS	LIQUID JET'S UNE STATE AT	TOXIC
waste fuel	The St Dipone	FLAMABLE
PLATING SCUDGE		TONC
The similar City	,	Tok
DESTILIOLS/LERISICIOES		TOXIC/CARCINOGELI
+ OJLY SMALL	pultities AT SITES TO	RE ZUNPIEZ
Describe Potential Environm	ental Hazards Porental Dec	RADATION OF GROUND LUAL ?
	WY GRADIENT GROUD WAR	
	-BASE DOMESTIC WELLS	
Describe Potential Worker Ha	izards POTEUTIAL EXPOSURE -	O VAPURS DURING
~	TENTIAL DERMAL EXPOSURE	
	YEN AND SAMPLING DERM	
	GREATEST RISK IS FROM	
	WELL INSTALLATION. ENDISE	
		HESE OULY 44 170 - 2
		THE RESULTS OF PREMOVE
work AT MATHER A	FB.	
ACTIVITY CONSIDERATION	5	
Will site officials be with you	<del>-</del>	
	Known Assumed	Unknown
•	ial offsite, human receptors au	
	CAR ALL SITES. WEST DI	
	HOUSING (TRAILER PARK) AL	
List Particular Activities Pla	inned:	
<u>Activity</u>	Location	<u>Date</u>
DRILLIUG /WELL INSTALATED	M FACTU AREA, WEST DITCH	<del></del>
WOLL DEVELOPMENT	7100 ARGA F	JULT + AUGUST 1486
Solt/well SAMPLING	NORTHIGHT PURIMETER	<u>}</u>
GEOPHYSICAL SURJEYS	ALLW AREA + 7100 AREA	
AV-F-HS07b		

#### SAFETY CONSIDERATIONS

If there is more than one level of hazard, or if there are multiple "sites" within a "site," a separate page 3 and 4 should be completed to show specific safety considerations for each location.

Work Location ACU DISP	osal 7100 bisposal Jest	DITCH A. E PERIMETER
Objective of Work at This L	ocation well justification Aud	WATER SAMPLIUE.
	IL CAS AND SOIL SAMPL	
BE COUDUCTED	AT ACID. (SEPARATE SHE	MY PLAS SILL BE
MADE FOR SOIL	SAMPLIAL)	
Level of Protection Planned	:ABC/I	
Possible Modifications	RNDE BASED ON CONTINUOUS	OVM MONTORING
Surveillance Equipment:	we a constant	
OVA(^	WIZATION	0,
Explosir		
INSTRUMENT DESCR	ifnos WE iscubed o	1 ATTACHMEST 3.
ALSO WILL HAVE FI	RE EXTINGUISHERS, FAST AID	KIT AND
Body Coverings to be Used:		
Type of Boots: Steel	TOE LEATHER . UPERADE TO	D LEDIREJE IF LEEDED
Type of Gloves: LEATHE	n for brillers success	of healthead will be
Type of Face Protection	SUFFIF GLASSES	ETALUATED BURILLO
Type of Coveralls: cort	ON - THICK FOR SUIL + WATE	TR SIMPLIUS BRILLIAGE AAB
Additional Gear: 4020	HAT + GAR PROTECTION WILLY	
Work Party:		
		Level of
<u>Name</u>	Responsibility	Protection
PROGSOLOGIST	DRILLING INSPECTION, THRING	

<u>Name</u>	Responsibility	Protection
PROGSOLOGIST	DRILLING INSPECTION INALY	
CHEMIST / GU COLOR	SITE SAFETY CAMPLING	
GEOPHETICAL CREW	SOIL WS + GEOPHYSICAL STUDIES	
ornier + crew	PRILLING I WELL CONSTRUCTION	D

Site Entry Procedures 15 REQUIRED BY BASE PERSONNEL CHECK IN 1000

CUT AT THU GATE DAILY, SOCIAL WILL BE ADVISED OF RETURN EL

EACH DAY

Call CAM CURREN MSGI SPANES Before Entering, At (9 6) 364-2284 (Phone No.)

AV-F-HSO7c

* SUBJULANT PERSONNEL WILL BE HELD TO THE SAME SAFETY GUIDELINES AS AN PERSONNEL, PER SUBJULANT.

(ı) Criteria for Changing Protection OVM READOUTS > 10 PPM ABJUE BACKGROUTO 14 BREATHING LONG - PERIOR TO LEVER C. TIM PPM WILL REQUIRE SEBA. LPGRADE TO SURGEOUS AND MEDPRIENE GLOVES IF MEEDEN (2) CEPHYSICS/SOIL GAS ALE ADI-INTRUSINE. Decontamination Procedures STEAM CLEAN RIGAGO TOOLS - SUMPLINE EQUIPMENT CLEANED WITH ALCOHOL RIUSED WITH TAP WATER ALIA DISTILLED WATER. NO EQUIPMENT WILL LEAVE SITE WITHOUT DECON. BE SET UP (DISED ON SITE COLOTTOLS) ACCORDED TO APPOPLIATE ESTABLISHED PROCEDULES Work Limitations (Time of Day, etc.) I'S REQUIRED BY ISAGE PERSONUEL CARE WILL BE GIVEN DURING HOT DATIME HOURS TO AYOU HEAT STRESS OFFICER WILL BE RESPONSIBLE FOR MODIFICATION FOR VISUAL SIGHS OF HEAT TRE AIR CONDITIONING AND NATER UQUIDS WILL BE MAILABLE FOR ALL FIELD LOCKER Disposal of Disposable Materials, Drill Spoils, Decontaminated Water, etc. SOIL AS DIRECTED BY BASE PERSONUEL - IF LOT CONTAMINATED. COTAMILATED SOIL WILL BE DEVINNED ALL KEPT OF SITE. WILL BE LEFT AT THE DECLHEAD. AKTER Location of Nearest Phone Marie Phone 11 5110 Nearest Water WATER AT SITE - SUFFICIENT FOR ORIUNING WAYHOU, + SARO MATER TO Public Road MITTHER SIELD ROAD Provide Site Sketch (with all relevant facilities)

> (1) AT OR BELLEW THE PERMISSIBLE EXPOSURE LIMITS (COLOSHA) TOR THE 3 PRIMARY CHEMICALS FOUND PURIUS PHASE IT STAGES SAMIRIUS

> > PELS:

SEE ATTACHED , MAP

TCE ZSPA

PCE 50 PPM

(MODITORIAL FOR BREATHING ZOJE COJE. DILL BE CONTINUOUS).

(2) CRITERIA FOR UPERIOLIS TO LEOPRELE BOOTS

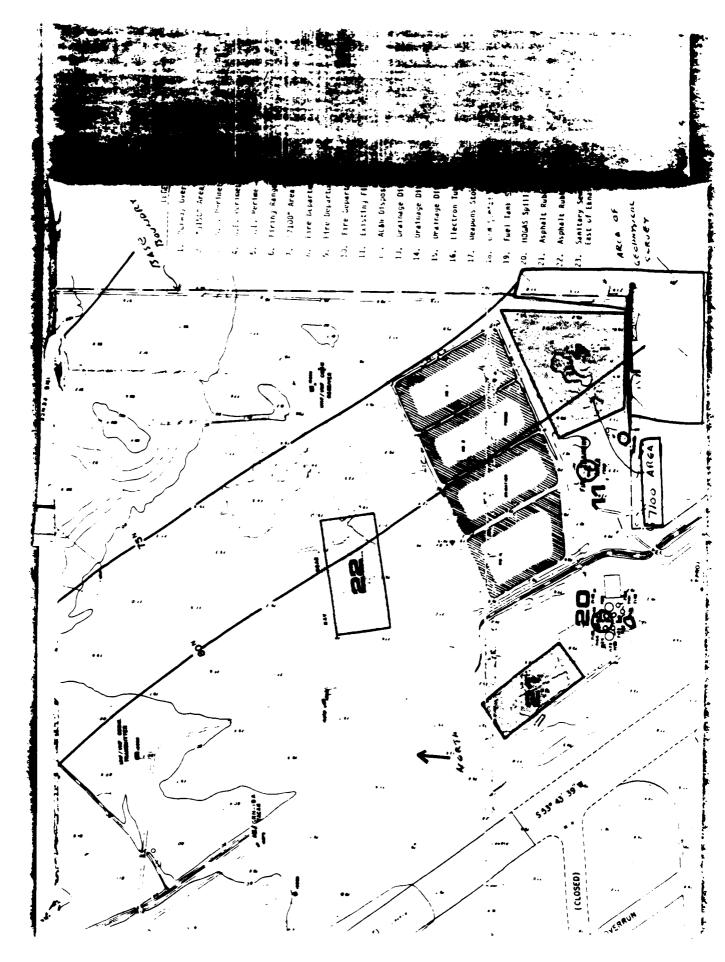
ALL BE ALY OWN READILS

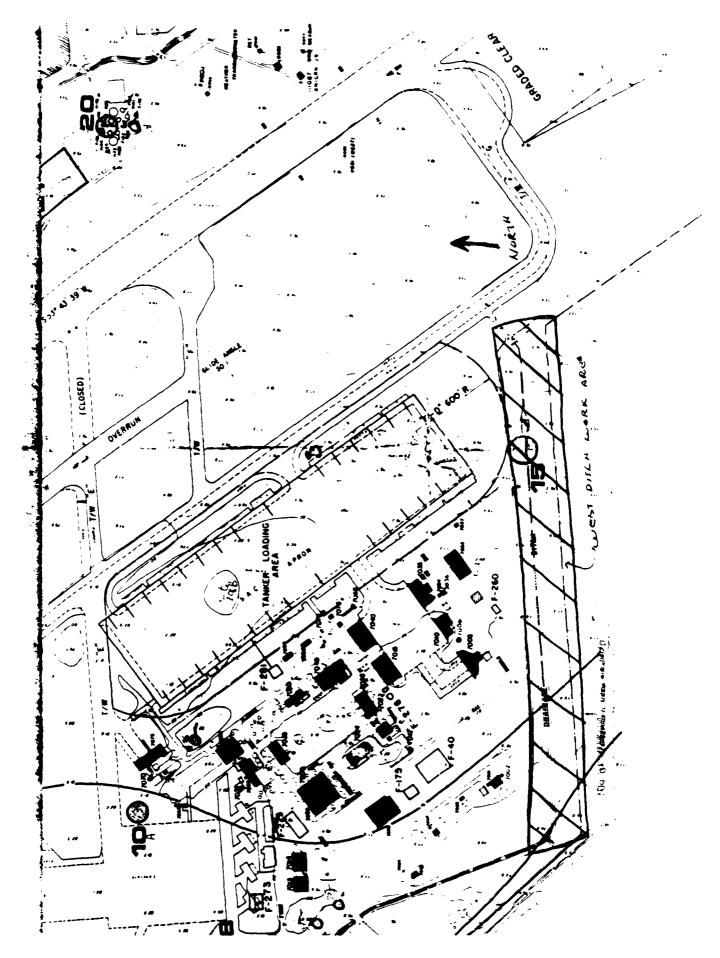
ABOVE BACKGROUND AT THE BOKEHOLE OR

MUBPIT. MONITORING AT THESE LOCATIONS

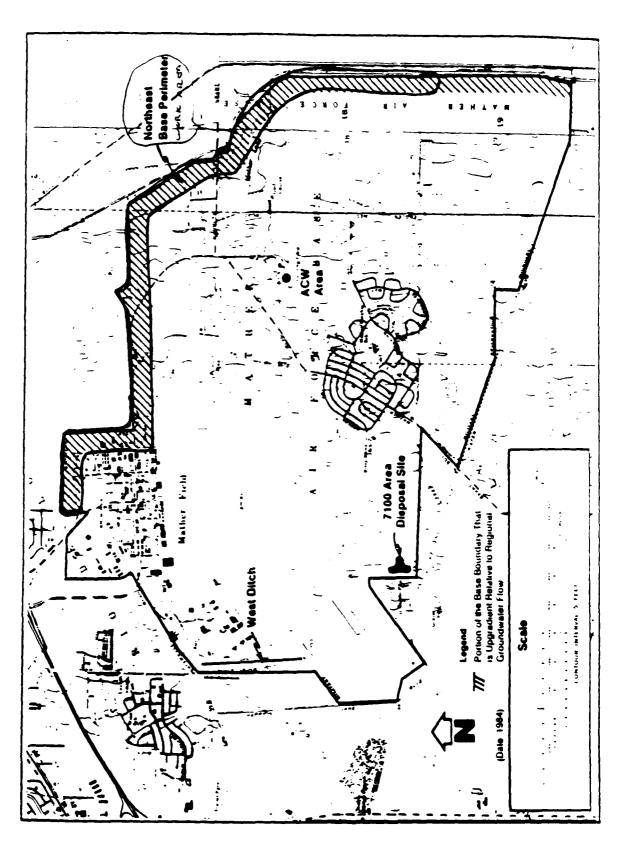
LILL ALSO BE CONTINUOUS

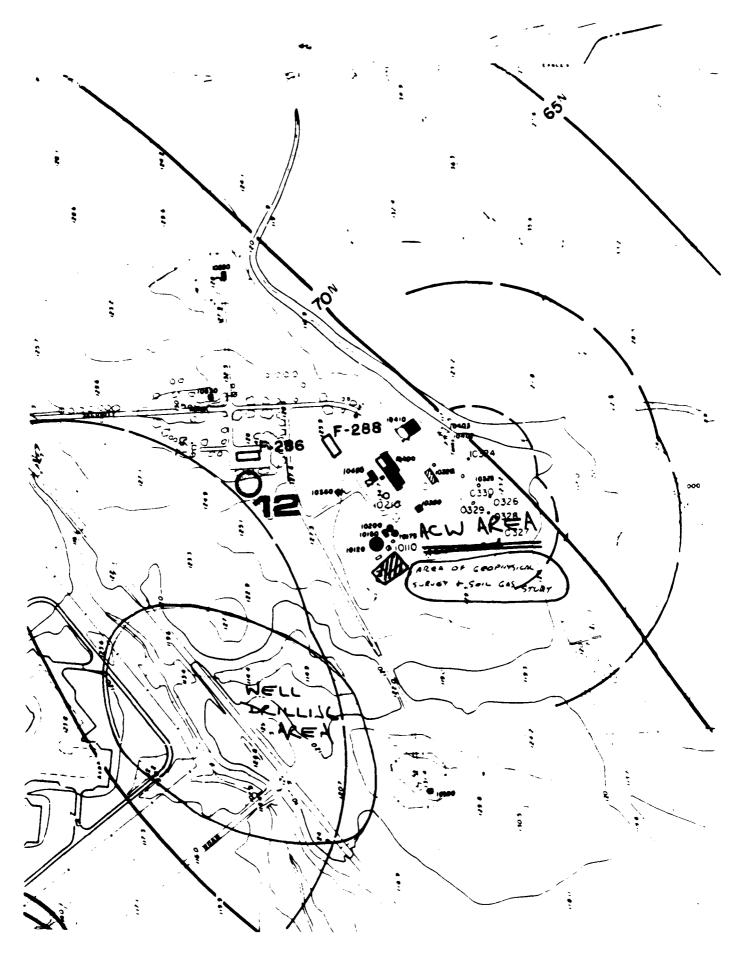
K-4





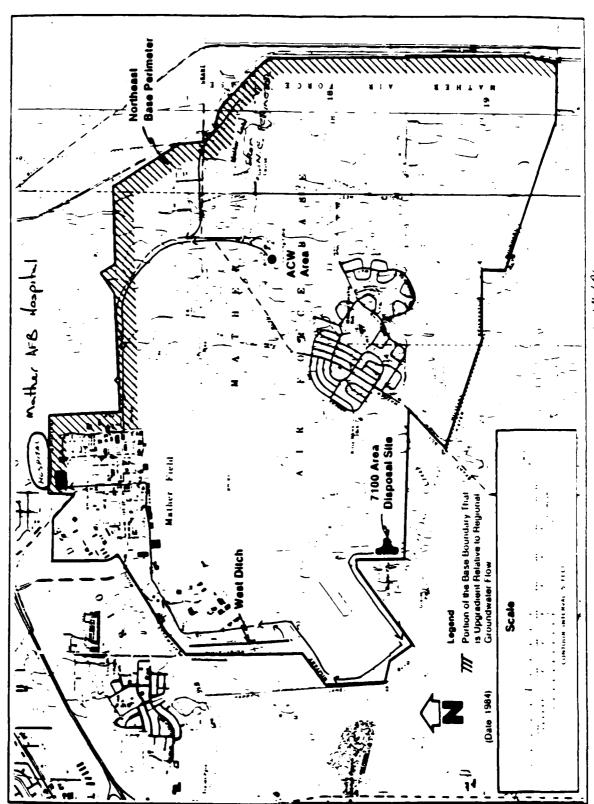
K-6





EMERGENCY PLANNING	
Phone Numbers	
Credit Card	557-137- 25/3- 4343
Local Police	364-2314
Local Ambulance	3cy-3333 (enem.) - 12 3cy-3213
Local Fire Dept.	364-4100 (MAIN BASE) 362-1396 (HOUSE AREA)
Local Hospital	364-3333
Local Airport	<del></del>
Client Contact	1-800-821-4528 (BROOKS AFB) (916) 364-2284 KMATHER AFB)
Is there a phone at the site? You	If yes, number will ROUT MODIC TOLEPHONE
(Report this number with your su	pervisor and receptionist before leaving for the field)
Emergency Phone Numbers	
AeroVironment Office	357-4463 (818)
Home of CHS* Officer	(213) 259-9934
Director, Env. Programs	(918) 799-6486
V. P. Env. Serv. Div.	(818) 774 - 6126
Exec. V.P.	(818) 799-6572
Company Physician	
Med-Tox Consultants	(714) 669-0620
Subcontractor's Office	(714) 876-5360 - DRILLER
Hospital Route (attach map with	route highlighted):
Provide directions to nearest ava	illable medical facility: See ATTACHED
*Corporate Health & Safety	

AV-F-HS07e



Service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the servic

ATTACHMENT 1
PREVIOUS FINDINGS

ŧ

# SUMMARY OF PREVIOUS FILL 165

# PHASE I STAGE 1

# · A= D DISPOSAL AREA

3 JELLS JERE BRILLED ISIJE MUD ROTARY METHODS, ALL DOUJ-GRADIEST

SAMPLED IN MAY 1785 AND NUMBER SES

#### RESULTS:

MAFB-1 TCE B/460 ppo Bensene } Trace evels

MAFB-Z TC€ 13/36 ppb

MAFB- 3 TCE 27/33 ppb

# · 7100 AREA

3 DELLS, DOWN-CRADIENT, MUD-ROTAR;

#### RESULTS

MARB-7 NO REPETABLE LESULTS

MAFB-8 TOE 87/100 pp

PCE 5/20 ppb

chlorobensene 1/3 ppb

Dichlorobensene Trace

MAFB- 9 TCE 4/5 pp6

PCE 1/1 ppb

# · WEST DITCH WEA

2 HELLS, DOUL- CRADIENT, MUN-ROTARY

20 SIGNIFICANT RESULTS

# · NOCTHERS THE REPORT OF WIND WITH A SIGNIFICANT RESULTS

THROUGHOUT THE BRILLIAL PROGRAM TO CHAIN APOR READIALS WERE MADE ABOVE BACKGROUND. NO OTHER HEALTH / SLEET, PROBLEMS WERE IDENTIFIED.

### PHSE I STIGE 2

OTHER SITES DELE STUDIED. A SERIES OF DELLS DERE MATALLED USING AIR ROTARY DY CASING HAMMER.

- · LATER SAMPLIAG RESULTS ARE LOT YET
- · 20 ELEVATED OUN READILLES LEVE MADE BURILLE THE BRULLING OF ANY OF THE LEUCS.
- · HOLLOW STEM ASGERIAG WORK WAS bose, also sithout Elevated oim readises.

# PHASE I RECORD SEARCH

SUNCES OR SIGNIFICANT PESTICIBE /HELD - NE

ATTACHMENT 2

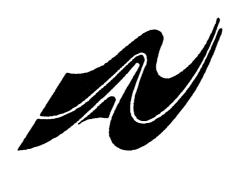
EXECUTIVE SUMMARY

AEROVIRONMENT INC.

CORPORATE HEALTH

AND

SAFETY PLAN



August 1984

# AeroVironment Inc.

145 VISTA AVENUE - PASADENA, CALIFORNIA 91107 USA (818) 449-4392

#### EXECUTIVE SUMMARY

AeroVironment (AV) has prepared this Corporate Health and Safety Plan (CHSP) to help provide for the safe completion of AV field programs at known or suspected hazardous work locations. Primarily, this plan is intended for workers and managers involved in AV's hazardous waste projects. However, it also applies to any project which involves above-average risks from chemical exposure or respiratory hazards. The plan describes the procedures the company takes to minimize the risk to workers, the company and its clients. A Corporate Health and Safety Officer has been selected to oversee and implement this plan.

The company's employees have been assigned to one of three safety categories according to the type of field projects they will work on. Training, respiratory protection, recordkeeping and medical examination requirements have been set up for each of the two participant categories. Planning is done before each field program to determine if there are hazardous environmental conditions at the proposed work location or if the work assignments will require handling or sampling hazardous wastes or materials. If special safety planning is appropriate, this CHSP will be implemented on that project. Only properly trained employees will be assigned to field jobs where potential chemical hazards exist. A specific safety plan will be prepared for each potential hazardous site. It will be prepared to provide specific actions which will be used at that site to comply with this overall plan.

The company's policies, procedures and standards pertaining to hazardous field work are described in Section A. This includes a description of how the plan is to be implemented into specific AV projects and proposals. Section B describes the general safety requirements of the plan. Industrial hygiene considerations are described in Section C. This includes a brief review of necessary worker protection from harmful chemicals and waste materials. Sections D, E, F and G describe the four key elements of the Corporate Health and Safety Plan: Medical Monitoring requirements, Respiratory Protection plan, Training requirements and Recordkeeping functions. The Corporate Health and Safety Officer is responsible for implementing these four elements of the CHSP directly or through Med-Tox Associates, Inc.

The general plan is supported by numerous standard procedure documents which describe in more detail the methods which should be used to properly implement the CHSP. Specific guidance on the company policy, plan implementation, worker rights and responsibilities and program objectives should be sought from the Corporate Health and Safety Officer.

ATTACHMENT 3

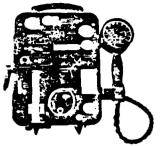
INSTRUMENT SPECIFICATIONS

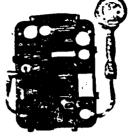
Effective March 1, 1984 Supersedes December 1, 1983 OVA128, OVA108 Series

The OVA128 and OVA108 Series CENTUF / Portable Organic Vapor Analyzers provide continuous direct readout of total organic vapor concentration for screening and survey purposes (Mode 1), and qualitative and quantitative analyses using the gas chromatograph option (Mode 2).

# Ordering Instructions - Specify

- 1. Model Number
- 2. Accessories from Page 2





OVA 128

OVA108

#### Standard Specifications

Readout: OVA128: 0 to 10, 0 to 100, and 0 to 1000 parts per million (ppm) linear scales

OVA108. 1 to 10 000 ppm, logarithmic scale

Minimum Detectable Limit (Methane): OVA128. 0.2 ppm

Response Time. Approximately 2 seconds

Fuel for Detector Hydrogen

OVA108. 1 ppm

Carrier Gas for Chromatograph: Hydrogen (self-contained tank)

Sample Flow Rate. Approximately 1 litre per minute.

Concentration Alarm. Aud bie, user selectable level

Internal Calibration OVA128. No OVA108. Yes, 2 point

Electrical Power: 12 V, rechargeable battery

Voltage Output to Recorder: 0 to 5 V dc

Flameout Indication: Audible and visual

Service Life in Portable Mode: 8 hours

Filters Sintered metal, user cleanable

Model and PRICE

U.S.A.

Model and Description	Mode.	, PA 0E
OVA = CENTURY Portable Organic Vapor Analyzer Includes sigeback, tool kit.		i
probe/readout, pattery charger, hydrogen their hose, shoulder strap, proces, earchone, manual, and carrying case.	OVA	5200
128 = Linear state: 0 to 10,0 to 100, and 0 to 1000 ppm	128 108	Net Net
Type: -A = Basic flame ionization detector for total hydrocarbons monitoringB = Gas chromatograph, includes 2 chromatograph columns ia G-24	-Д	Net
and a T-12), injection valve, backflush valve, charcoal filter, and plumbing	-8	Add 1125
cludes a stripper column, T-24 analytical column, charcoal waste collector, injection valve, backflush valve, charcoal bypass filter, and plumbing.	·c	Add 1350
Battery Charger:  1 = 120 V.60 Hz  2 = 220 V.50 Hz  3 = None	1 2 3	Net Net Refer to Foxboro
Classification  E = FM certified. For use in Class I, Groups A, B, C, and D, Division 1 hazardous environments.  F = BASEEFA certified. Ex. ib. s IIC T4 BASEEFA No.	E	Net
76002/B std. SFA 3007.	F	Net
Optional Features Strip chart recorder.		
-A = FM certified -B = BASEEFA certified	а .з	Add 440 Add 440

@Registered Trademark

The Vicael 580 Portable Organic Victor Neter has been designed primarily as an industrial hygiene safety rool. Its applications, however, extend to the entire environmental area as well as such diverse uses as leak testing and leak sourcing.

# features

# **Portability**

The Model 580 Portable Organic Vapor Meter is a self-contained system requiring no external services. The instrument will operate in the field off of its own internal pattern back for at least 8 hours, its light weight makes for very easy transportation.



# Linear Dynamic Range to 2000 ppm

Because of the large awham of range required in the measurement of organic vapors in ambient air and the work environment, special care was taken in the design of the Photolonization Detector to ensure adequate inearty for these measurements The Photoionization Detector design has a linear range from 0 to 20 ppm with a minimum detectable of 1 ppm on the 3 to 200 ppm. scale. This wide avnamia range is conveniently displayed by the digital readout and sidsignificant improvement on other instruments in the field

# Photoionization Detector

The principle of derection for the Model 580 is Photoionization, which provides high sensitivity for most organic vapors and some norganic materials. The detector has a minimum detectable of 11 ppm and can measure sample concentrations up to 2000 ppm. Additional advantages of this detector are its high stability and low hoise.

# Sample Collection

it is duite offen necessary to measure organic vapor concentrations in an environment as well as collect an integrated sample. Because the Model 580 is a nondestructive system and has an exit port on the rear of the instrument, an integrated sample can be objected during the actual measurement of the environment. This is accomplished by attaching either a charcoal tupe or a sample bag on the rear of the instrument and collecting the sample during measurements. This integrated sample can then be analyzed later for individual constituent concentrations using gas chromatography or a similar technique.

# Operator Designed

The Model 580 was designed with the operator in mind utilizing a liquid prystal display the concentration readout can be made in carrier, a areas as well as bright sunlight. The detector was designed with duick and easy removal of the lamb for cleaning. This also provides an easy.

Alarm Set.

This disc provides an easy method of changing to lamps of different anization energies. A Calibrate/Spani adjustment is also provided on the front panel in addition to a settable alarm. This allows auick recalibration of the instrument for different specific materials and correlation from one amp to another as different energy idmps are added.

Audibie Alarm-

Power Switch

Span Set-

Range Switch -

Carrying Strap



# principals of operation

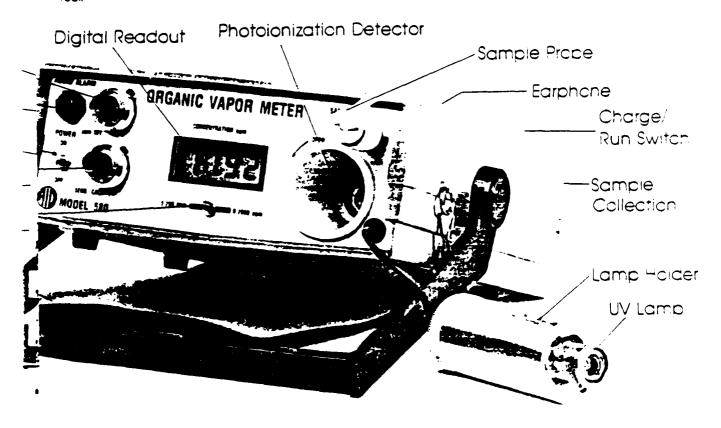
The Photoconization Detector utilizes a high energy utitia-vicies amplito chize the sample which is arawn into the instrument. The chized sample produces an on purent which is proportional to concentration and is measured with a pigo ammeter.

The lonization is a fundamental process. A photon of light from the UV source energizes an electron of the sample molecule producing an ionized species and a free electron:

R - hv - R* + e*

For this reaction to occur, the photon energy (hv) must be equal to or greater than the ionization potential of the sample molecule, in general, the PID will respond to most organic compounds, it is insensitive to methane, ethane, and most of the permanent gases. This insensitivity to materials normally found in ampient air makes the PID a selective device and an invaluable instrumental tool.





# specifications

# Measurement

Photo chicar on Defection of most organic vapar and same vocapanic fecon que

gases

anges

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Minimum Derectable Compensate on 3-200 ppm sade Sensitivity

3) stem Time Constant | 20 sec of maximum sample how Nominal Flow 500 milimin Sampling Pare

Dat and Particulate Filter Avairable — Dat an 31 Sample Canditioning

# **Power Requirements**

ntema Rechargedale Charger

provided.

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- 1 - 2 ye - 2e - ev - 115 222 142 62 62 62 4 wars - maximum Charger Requirements

# Controls, Panel

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Dero ballust with bero air Span dalusted with span gas Caleration

De 200 dam with resolution to 1 dam - ---Pliker selection for instrument Onarge 40 un Batter run د. : -

# applications

The Made (680) is so sensifive and vers<mark>at le an instrument</mark> that its application is an it imited by the imagination of the operator Below are listed several call bus applications for the instrument. Other applications cending can be sele oped as need a otates. For example, the instrument mal de usea as a leak defector of a fechnique for coating to is night storage area ero

# Industrial Hygiene Monitoring

Because of the increasing complexity of organic exposure to the worker in his work environment it becomes more and more important that a complete understanding of the exposure levels be maintained. The Model 580 can easily be moved throughout a work area to measure the a fferent organia vacor concentrations in different poations and at different times. This type of record is hus udbie in seveloping an understanding of worker exposure and evaluating efficiency of the exhaust system

# Total Sample Collection

At the same time the area is deing monitored and measurea, an integrated sample can be obliected by alacing a charcala rube or a gas tambing loag on the rear of the 580. The Photo on tation Defector is a handestructive defector and as a result, does not modify

# Other Features

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Sun am la Barraniane Compact of omiliar up; here lear

Physical

Senon mount 15 x 22 5 x 25 4 57 1 x 3 x 13 n 1 HW2 Date : 19

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or change the chemical character of the sample pend. so ected in sun que reature will a low one to beneve to and value the individual components of the fordition die at a later date knowing both the concentration of the total sample and the individual constituents the objections now is armed with very protound data which will but it understanding worker exposure

# **Environmental Surveys**

A thirthe increasing emphasis on the environmental problems especially andress is moonant to realize thist there is an instrument available that has sufficient sensitivity to measure very low concentrations of organ materials that may be seeding from the earth's surface This type of use. In addition to just basic ambient or monitoring, makes the 580 a very effective too both in the work environment and at the ambient air levels where the concentrations are exceedingly low

Rt. 41 & Newark Road, Avondare (PA 19311 | 215, 268, 3181 | TELER (BETLL)

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TABLE 1.

FOXBORO CENTURY 128GC OVA RELATIVE RESPONSE FACTORS BASED ON METHANE

	RELATIVE
COMPOUND	RESPONSE
=======================================	
METHANE	1
TCE	0.7
TCA	1.05
TRANS-1,2-DCE	0.5
FCE	0.7
BENZENE	1.5
TOLUENE	1.1
m-XYLENE	1.11

THE FLAME IONIZATION DETECTOR WILL RESPOND TO MOST ORGANIC COMPOUNDS, ESPECIALLY NON-SUBSTITUTED HYDROCARBONS. IT IS ALSO RELATIVELY SENSITIVE TO HALOGENATED HYDROCARBONS. SENSITIVITY DECREASES FOR DXYGEN AND NITROGEN-CONTAINING COMPOUNDS. THE INSTRUMENT IS CALIBRATED USING METHANE AS THE CALIBRATION GAS, AND THE RELATIVE RESPONSE FACTORS FROM TABLE 1/ ARE APPLIED TO ACTUAL FIELD MEASUREMENTS.

TABLE 1.

AID MODEL 580 ORGANIC VAPOR METER (FID) RELATIVE RESPONSE FACTORS BASED ON BENZENE FHOTOIONIZATION POTENTIALS

COMPOUND	PHOTOION. POTENTIAL	RELATIVE RESPONSE
		. AEO
ACETONE	9.69	0.452
BENZENE	9.25	1
DIETHYL AMINE	8.01	0.509
MEH	9.53	0.1
PROPYLENE	9.73	0.454
TOLUENE	8.82	0.814
TCE	9.45	0.734
m-XYLENE	8.56	<b>. 9</b>

THE AID 580 HAS A 10 eV UV SOURCE. THE DETECTOR WILL RESPOND TO COMPOUNDS HAVING PHOTOIOIZATION POTENTIALS OF 10 eV OR LESS. THE INSTRUMENT IS VERY SENSITIVE TO AROMATIC AND UNSATURATED ORGANICS AND AMINES. METHANE AND SATURATED CI-CS HYDROCARBONS CANNOT BE DETECTED USING THIS INSTRUMENT.

APPENDIX L

Daily Activity Log

1

1

# o Drilling and Well Installation

Thursday, July 30, 1986. The field geologist met with representatives of the USAF and the California Regional Water Quality Control Board to stake well sites on base.

Friday, July 31, 1986. The field geologist finished staking the groundwater monitoring well sites and conducted a records search on base.

Wednesday, August 13, 1986. The drilling crew from Beylik Drilling Company met with the field geologist to review the sites and set up their equipment on base.

Thursday, August 14, 1986. A representative of DOHS TOXICS was on base to check the well sites. The drilling crew was still preparing to drill.

Friday, August 15, 1986. The drilling crew started drilling Well 43 at the 7100 Landfill. Drilling was hindered by the geology in the area and stopped at a depth of 30 feet.

Saturday, August 16, 1986. Well 43 was drilled to a depth of 141 feet and an E-log was run.

Sunday, August 17, 1986. Perforated casing was set from 108 to 128 feet at Well 43. It was then gravel packed and grouted to ground surface.

Monday, August 18, 1986. Drilling rig down due to electrical problems. The geophysical crew toured the sites to be used for the EM survey at the 7100 Landfill area and the ACW site.

Tuesday, August 19, 1986. Well 44 was drilled to 58 feet. The geophysical crew performed an EM survey at the 7100 Landfill area.

Wednesday, August 20, 1986. The drilling crew continued drilling Well 44 to a depth of 113 feet, where an E-log was taken. Well screen was placed from 60 to 80 feet and the well was gravel packed and grouted to surface. The geophysical crew performed magnetic profiling at the ACW site.

Thursday, August 21, 1986. The drillers started Well 45 and drilled to 103 feet. An E-log was completed. The geophysical crew performed a ground penetrating radar at the ACW site.

Friday, August 22, 1986. At Well 45, well screen and casing were set and the annulus was gravel packed and grouted. The geophysical crew continued the magnetic profiling survey and performed a pipe locator survey at the ACW site.

Saturday, August 23, 1986. The drilling crew drilled Well 47 to 105 feet and AV ran an E-log. The geophysical crew performed additional conductivity survey work at the 7100 Disposal Area.

Sunday, August 24, 1986. At Well 47, the drilling crew set the well screen and filled the annulus with gravel pack and grout edit to the surface. Next they drilled Well 48 to 128 feet and the hole was E-logged.

Monday, August 25, 1986. At Well 48, the well screen was set and the annulus gravel packed and grouted. Next, the drilling crew advanced Well 63 to 40 feet.

Tuesday, August 26, 1986. The pilot hole for Well 63 was advanced to 212 feet.

Wednesday, August 27, 1986. The E-log was taken for Well 63. The drill crew then started reaming the pilot hole in order to place the conductor casing. They advanced to 70 feet.

Thursday, August 28, 1986. The drilling crew finished reaming Well 63 and started to set the conductor casing.

Friday, August 29, 1986. The drill crew could set conductor casing only as far as 70 feet because of problems with the casing.

Tuesday, September 2, 1986. After more problems with setting the conductor casing at Well 63, the field geologist decided to abandon this hole according to California state standards and start a new one at the contractor's expense. Tracer Research Inc. begins soil gas survey at ACW site.

Wednesday, September 3, 1986. The drill crew started a new hole 8 feet away from the original Well 63. They advanced it to a depth of 50 feet. The soil gas survey continued at the ACW site.

Thursday, September 4, 1986. The drilling crew resumed drilling Well 63 to 155 feet. A second rig arrived on site and drilled Well 62 to 60 feet. The soil gas survey continued at the ACW site.

Friday, September 5, 1986. At Well 63, the drilling crew set conductor casing only as far as 120 feet. The desired depth was 157 feet. At Well 62, the second crew drilled to 240 feet and an E-log was attempted but failed because the hole collapsed. The soil gas survey continues at the 7100 Disposal Area.

Saturday, September 6, 1986. Problems with the conductor casing forced the drilling crew to remove the casing from Well 63 and to redrill again. Conductor casing was then set at 155 feet. The E-logger attempted to E-log Well 62 but failed again. The soil gas survey finishes work at the 7100 Disposal Area and ACW sites.

Sunday, September 7, 1986. The drilling crew redrilled Well 62 and an E-log was taken. At Well 61, the drill crew started the hole and drilled to 160 feet. At Well 63, conductor casing was grouted in place.

Monday, September 3, 1986. The development crew arrived and developed Well 47, 43 and 44. At Well 61, the drillers advanced the hole to a total depth of 240 feet. After some difficulties, an E-log and a caliper were taken there. Well 63 was drilled down to 212 feet and the well screen was placed at 175 to 195 feet.

Tuesday, September 9, 1986. The development crew developed Well 45 and 63. The pilot hole at Well 62 was reamed to 40 feet. The pilot hole at Well 61 was reamed to 55 feet. The development crew bailed Well 48.

Wednesday, September 10, 1986. The development crew finished Well 48. The drilling team finished reaming the pilot holes for Wells 61 and 62. The conductor was set to 122 feet in Well 62. The development of Well 45 was completed. The development crew reported 15 feet of fill in Well 63 was producing 7 gal/min of sandy and silty water.

Thursday, September 11, 1986. The drilling crew reamed Well 61 to a depth of 214 feet. The screen and casing were inserted in the hole with the screen at 184 feet to 204 feet and the well was completed. Well 62 was reamed to depth of 215 feet and the screen set at 181 to 201 feet ±1 foot, and completed according to specifications. The development crew finished Well 63.

Friday, September 12, 1986. A pilot hole was drilled for Well 64 to 190 feet and for Well 65 to 225 feet. The development crew worked on Well No. 62.

Saturday, September 13, 1986. The construction crew set the conductor casing to 115 feet in Wells 64 and 65. Both wells were then grouted and left to set overnight.

Sunday, September 14, 1986. The bottom of Well 64 was drilled to 210 feet and Well 65 to 225 feet. The screen was set at 175 to 195 feet in Well 64, and 195 to 215 feet in Well 65. Well 65 completed as designed. At Well 64, gravel was placed to 171 feet, silica sand to 169 feet, and bentonite to 164 feet. It was

then grouted and completed. The drillers went on to drill Well 49 to a depth of 25 feet. In moving the second drilling rig to Well 66, the axle broke on mud system trailer. The rig would not be operational until 10:00 to 11:00 A.M. on September 15.

Monday, September 15, 1986. Well MAFB-49 was drilled to 120 feet and the screen set at 97 feet to 107 feet. The casing was then set and the well completed according to design. The drillers moved on to MAFB-66 and drilled the pilot hole to 205 feet.

Tuesday, September 16, 1986. Rain at times. The drill rig at MAFB-49 moved to the MAFB-40 well site in the gravel pit outside the 7100 Landfill area. The pilot hole for Well MAFB-40 was drilled to 124 feet and an E-log run. The screen was then set at 92 to 112 feet gravel packed and grouted in place. This completed the well according to design.

At Well 66, the conductor casing was set and grouted to 142 feet. It was decided to drill below 200 foot level to next aquifer since E-log showed the gravel at approximately 155 feet to be in a clay matrix. The extra drilling would take place the next day, after the conductor casing grout had set.

Wednesday, September 17, 1986. The drill rig at Well MAFB-40 moved to MAFB-41, the well site where the pilot hole was drilled and E-logged. The pilot hole was reamed to 153 feet. The E-log indicated the screen should be set at 100 to 120 feet. Since gravel was found at 260 feet at Well MAFB-66, it was drilled to a total depth of 280 feet. After E-logging, the screen was set at 247 to 267 feet. Screen cleaned using Alconox and dried with a torch to volatize hydrocarbons (because the steam cleaner was broken).

Thursday, September 18, 1986. Wells MAFB-41 and MAFB-66 were grouted and thus complete. The drill rigs moved to Wells MAFB-42 and MAFB-55. A large auger rig was brought into install 50-60 feet of surface casing in a few sites where cobbles were a problem. The auger rig completed work at MAFB-52, where the surface casing was set to 55 feet. The auger then began work

at MAFB-46. The MAFB-42 pilot hole was reamed to 130 feet and E-logged. Then the screen was set at 90 feet to 110 feet, and the well was grouted and thus complete. At Well MAFB-55 work stopped at the 110-foot depth.

Friday, September 19, 1986. At Well MAFB-55 the drillers advanced the pilot hole to 250 feet. Well MAFB-46 was drilled to 110 feet. E-logged, and the screen set at 70 to 90 feet. The well was then completed according to specifications.

Saturday, September 20, 1986. The drill rig at Well MAFB-55 was repaired, and the conductor casing was set at 126 feet. At Well MAFB-59, the pilot hole was drilled to 240 feet.

Sunday, September 21, 1986. Well MAFB-55 was completed and the conductor casing set in Well MAFB-59.

Monday, September 22, 1986. At Well MAFB-59 the bottom of the reamed hole was drilled to 250 feet, but the E-log indicated that the desired screening zone was at 190 feet, we backfilled the hole with sand and sealed it with a bentonite plug from 185-190 feet. The well was built and completed according to specifications. The pilot hole for Well MAFB-57 was drilled to 200 feet and the well was E-logged.

Tuesday, September 23, 1986. At Well MAFB-57, conductor casing was set and grouted. The drillers drilled the Well MAFB-58 pilot hole to 240 feet and an E-log was run. Well MAFB-58 was reamed to 150 feet.

Wednesday, September 24, 1986. Well MAFB-57 was completed. At Well MAFB-58, 10-inch conductor casing was set and grouted.

Thursday, September 25, 1986. Well MAFB-58 was completed. At Well MAFB-56, the pilot hole was drilled to 205 feet and the well was E-logged. Conductor casing was set and grouted. The drillers began the pilot hole at Well MAFB-60 and ended at 123 feet.

Friday, September 26, 1986. Well MAFB-56 was completed and sounded at 174 feet. At Well MAFB-60, the pilot hole was drilled to 240 feet and E-logged.

Saturday, September 27, 1986. Well MAFB-50 was completed. At Well 60, the conductor casing was set and grouted.

Sunday, September 28, 1986. Well MAFB-60 was completed. At Well MAFB-68, problems were encountered due to caving. Work stopped at 110 feet for the night. The drill rig was moved to the site for Well MAFB-73 so drilling could begin in the morning.

Monday, September 29, 1986. Well MAFB-73 was drilled and completed. Its total depth was 135 feet, with the screen set at 112 to 132 feet. The drillers sank the pilot hole for Well MAFB-68 to 245 feet. Well development began at Wells 62 and 46.

Tuesday, September 30, 1986. MAFB-68 was E-logged. Well MAFB-75 was drilled, E-logged, and completed. Its total depth was 114 feet, with the screen set at 91 to 111 feet. At Well MAFB-68, the conductor casing was set and grouted. Wells 49, 61 and 60 were developed.

Wednesday, October 1, 1986. Well MAFB-68 was completed at total depth of 245 feet. Its screen was set at 207 to 227 feet. Well MAFB-52 was drilled and completed at 140 feet with its screen set at 105 to 125 feet. The Well MAFB-67 pilot hole was drilled to 10 feet. Well development continued on Well 61 and began at Wells 58, 55 and 40.

Thursday, October 2, 1986. The drillers advanced the pilot hole for Well MAFB-67 to 210 feet. The E-log was completed. MAFB-67 was reamed to 40 feet. They then drilled the Well MAFB-70 pilot hole to 200 feet and ran the E-log. Well development continued on Wells 61 and 49 and began at Wells 56 and 42.

Friday, October 3, 1986. Conductor casing was set and grouted in Wells MAFB-67 and 70. Well development began at Wells 41, 57, 40 and 68.

Saturday, October 4, 1986. Well MAFB-67 was completed. The screen is set at 190 to 210 feet. Well MAFB-70 was also completed and the screen set at 183 to 203 feet. Well development continued at Well 68 and began at Wells 64, 65 and 75.

Sunday, October 5, 1986. The drilling crew drilled Well MAFB-54 to a total depth 144 feet, then completed it after setting the screen at 110 to 130 feet. Drilling at Well MAFB-69 was difficult; the pilot hole was drilled to 230 feet. Well development began at Wells 73, 75 and 66.

Monday, October 6, 1986. At Well MAFB-69, the conductor casing was set and grouted. At Well MAFB-71, the drilling crew sank the pilot hole to 240 feet, after which an E-log was completed. Well development began at Wells 50, 52 and 70.

Tuesday, October 7, 1986. At MAFB-69, the screen was set at 207-227 ft. and the well was completed. At Well MAFB-71, the conductor casing was set and grouted. Well development continued at Well 50 and began at Wells 59 and 67.

Wednesday, October 8, 1986. Well MAFB-71 was completed after setting the screen at 200 to 220 feet. After drilling the Well MAFB-51 pilot hole to 170 feet, the crew E-logged it. The pilot hole for Well MAFB-53 was then drilled to depth of 20 feet. Well development began at Wells 54, 61 and 62.

Thursday, October 9, 1986. The pilot hole at Well MAFB-53 was advanced to total depth, reamed and completed at a total depth of 180 feet. The screen was set at 157 to 177 feet. Well MAFB-51 was also completed and the screen set at 105 to 125 feet. At Well MAFB-72, the pilot hole was drilled to 100 feet. Well development began at Wells 69 and 71.

Friday, October 10, 1986. The pilot hole at Well MAFB-76 was advanced to total depth, reamed and completed with the screen set at 87 to 107 feet. At Well MAFB-72 the pilot hole was advanced to total depth, reamed and the conductor casing was set and grouted. Well development began at Wells 51 and 53.

Saturday, October 11, 1986. Well MAFB-72 was completed at a total depth of 215 feet; the screen was set at 195 to 215 feet. Well development continued at Well 61 and began at Well 76.

Sunday, October 12, 1986. The crew developed Well MAFB-72.

Monday, October 13, 1986. After painting the well casings, the driller placed screen caps on the wells and poured the final two cement pads.

#### FIRST SAMPLING ROUND

Sunday, November 9, 1986. The sampling crew pumped Well 51, but the pump stuck in well and had to be left overnight.

Monday, November 10, 1986. After freeing the pump, the crew sampled Well 51, then went on to pump Well 52. Again, the pump became stuck, but it was freed within an hour. The sample pump got stuck in the well because the flexible discharge line came loose and jammed in beside the pump, wedgeing it into the well. This problem was rectified by using tie wraps to keep the discharge line and the power cable together while the pump was in the hole. The wells are all straight. When sampling Well 52, the crew noted a slight sheen on water, which was dirty.

Tuesday, November 11, 1986. After pumping Well 70, the crew sampled it and found the water dirty. Wells 53, 71, 54, 72, and 3 were also pumped and sampled.

Wednesday, November 12, 1986. The crew pumped and sampled Well 67. At Well 2, they ran the pump only one minute, because it discharged heavy mud. After cleaning the pump, Well 2 was pumped and sampled in the afternoon. Thereafter they pumped and sampled Wells 68, 1, and 50 and pumped Well 69.

Thursday, November 13, 1986. After sampling Well 69, the sampling crew pumped and sampled Wells 63, 48, 11, and 61 and pumped Well 10.

Friday, November 14, 1986. After sampling Well 10, the crew pumped Well 62, which went dry. They pumped and sampled Wells 47, 60, 64, and 76. After pumping Well 45, they sampled Well 62, which had by that time accumulated sufficient water.

Saturday, November 15, 1986. The sampling crew pumped and sampled Wells 75, 65, 73, 66, and 49 and sampled Well 45.

Sunday, November 16, 1986. Wells 46, 59, 8, 58, and 9 were pumped and sampled.

Monday, November 17, 1986. Wells 43, 7, 44, 55, and 40 were pumped and sampled.

Tuesday, November 18, 1986. The sampling crew pumped and sampled Wells 42, 57, 41, and 56.

#### SECOND SAMPLING ROUND

Monday, December 8, 1986. The crew began the second round by pumping and sampling Wells 48, 63, and 10. Well 62 went dry when pumped, as it had on the first round. They left it to sample later. They then pumped and sampled Well 11, pumped Well 61, and sounded Wells 34, 35, and 33.

Tuesday, December 9, 1986. After sampling Wells 61 and 62, the crew pumped and sampled Wells 47, 60, 46, 59, 40, 55, and 8, pumped Well 65, and sounded Wells 30, 28, 29, 38, and 39.

Wednesday, December 10, 1986. The crew sampled Well 65, then pumped Well 75, which pumped dry. It was sampled later. Next they sampled and pumped Wells 76, 64, 73, and 66, and sounded Wells 19, 20, 21, 12, 13, 31, and 32.

They then sampled production Wells HW-04-G1, MB-01-G1, K-9-G1, HW-03-G1. MB-04-G1, HW-05-G1, HW-06-G1, and HW-01-G1 and pumped Well 58.

Thursday, December 11, 1986. The crew sampled Well 58, pumped and sampled Wells 9, 42, 57, 41, 56, 7, and 43, and pumped Wells 45 and 44.

Friday, December 12, 1986. After sampling Wells 44 and 45, the crew pumped and sampled Wells 49, 70, 52, 53, and 71, as well as sampling production Wells AC-01-G1 and JT-01-G1. They also pumped Well 54 and sounded Well 37.

Saturday, December 13, 1986. After sampling Well 54, the sampling crew sounded Wells 16, 17, 18, 27C, 22, 23, 24, 25, and 26, then pumped and sampled Wells 72, 50, 51, 69, 68, 1, and 67. Well 2 went dry when pumped and showed a very muddy discharge.

Sunday, December 14, 1986. On the last day of sampling, the crew sampled Well 2 and pumped and sampled Well 3.

# APPENDIX M

1

Quality Assurance Program/Sample Reliability

A key element of the QA/QC program was to establish routine quality control procedures not only at the instrumental analytical methods level, but also at the field sampling level. Sampling error can impact measurement data significantly, especially for sensitive parameters, such as volatile organic compounds, which require extreme care in sampling to minimize loss and prevent sample contamination. In many cases, analytical errors may account for a negligible small portion of the total measurement error.

# 1. Field Sampling Quality Assurance

The Mather field sampling program was carefully planned and executed. The sampling crew followed specific procedures throughout the sampling program to ensure consistency and minimize error. During groundwater sampling, the following steps were taken to assure reliability:

- o Well purging: All well-purging equipment (pump, discharge hose) was kept clean, including rinsing with drinking quality water between use at different wells. This procedure is considered adequate to prevent cross-contamination of wells; this equipment is not used to collect samples, only for well evacuation.
- Decontamination: Between well samplings, the sampling crew decontaminated all the sampling equipment. This process included a wash with Alconox detergent, a rinse with drinking-quality water and a second rinse with de-ionized water. We then wrapped the equipment in aluminum foil to ensure cleanliness. The well sampler (i.e., the crew member who handled the sample bailer) wore a new pair of latex surgeon's gloves while sampling each well. The first two bailers of well water were used to rinse the decontaminated sample bucket.
- o Sample containers: All sample bottles were cleaned to EPA protocols by the supplier and had Teflon-lined caps.
- o Sample preservatives: Preservatives were American Chemical Society certified reagent grade or better. Nitric acid for metals samples was analyzed spectral grade.

- o Sample integrity: Sampling crew personnel wore latex surgeons' gloves during sampling. Samplers used a new pair of gloves for each well sampled.
- o Field duplicates: Ten percent of the samples were split in the field and submitted as blind duplicate quality control samples to monitor overall precision.
- o Field blanks: One blind field blank was submitted to the laboratory for every 20 samples taken (two blanks per sampling round). It was prepared with purified, pre-analyzed water. The blank water was transferred to the stainless steel sampling bailer, which was rinsed twice, then sampled for VOCs. The bucket was then filled with water from successive bailers to sample for the remaining parameters. Samples requiring metals analysis were filtered through a 0.45 µm membrane and prefilter with the pressure filtration apparatus. Blank samples were preserved in the same manner as groundwater samples.
- o Field Measurements: Conductivity and pH meters were calibrated at least once daily. Calibrations were checked periodically during the course of the sampling day with pH standards traceable to the National Bureau of Standards (NBS), and the instruments were recalibrated if necessary. Groundwater temperature was measured with a digital thermometer, accurate to 0.1°C.
- o Field Observations: Thorough observations of each sampled well were entered in a field logbook for later comparison with laboratory results.
- Sample storage and shipping: Samples were placed on ice in insulated coolers immediately after collection and were kept at approximately 4°C during shipment. Upon receipt by the laboratory, the samples were kept in regulated cold storage at 4°C.

O Chain-of-custody: Sample custody was maintained by the sampling team until shipment. Each sample shipment included chain-of-custody forms documenting sample identification, date sampled, analyses required, sampling team members' names, signatures and shipping time and date. Transported coolers were taped securely closed with strapping tape for shipment. Custody seals were affixed to the cooler during shipment to alert the laboratory to signs of tampering. Laboratory sample control personnel were instructed to contact AV if coolers were delivered with broken seals.

# 2. Laboratory Quality Assurance

## a. Quality Assurance Plan

The Acurex laboratory maintains a project quality assurance (QA) plan for the Mather Phase II, Stage 3 analytical program, as well as method-specific quality control procedures which follow U.S. EPA guidelines. Key elements of the Mather QA plan are:

- o Project organization and responsibility.
- o QA objectives for measurement data -- define objectives for analytical precision, accuracy and completeness.
- o Sample custody procedures.
- o Calibration procedures, including frequency.
- o Analytical procedures -- define the methods employed for Mather IRP sample analysis.

- o Data reduction, validation and reporting.
- o Internal QC checks, including frequency.
- o Performance and system audits, including frequency.
- Preventive maintenance.
- o Assessing precision, accuracy and completeness. Methodspecific definitions.
- Corrective action.

The Acurex Quality Assurance Plan for analysis of Mather Air Force Base samples is included in Appendix E.

# b. Laboratory Quality Assurance/Quality Control Data

Quality control (QC) in the laboratory is monitored using method blanks, duplicate samples and matrix spike samples. Through the analysis of this QC data, the overall analytical accuracy and precision may be estimated on a method-specific basis. The greater the frequency of QC samples, the more representative this estimate becomes. The following is a discussion of the laboratory QC data by analytical method. A description of each method is presented in EPA, 1976; EPA, 1979; and EPA, 1982a and 1982b. Laboratory QA/QC sample results are shown in Table M-1.

# volatile Organic Compounds (VOC) EPA Methods 601/8020

Method blank and storage blank data show no signs of sample or system contamination, except for methylene chloride ( $CH_2Cl_2$ ) detected in the 601 blank samples in the range <0.5 µg/l - 4.1 µg/l. Methylene chloride, which is ubiquitous in most laboratories, was detected at comparable levels in the groundwater samples. No detectable levels of any other compounds were found in the blank samples.

TABLE M-1. Laboratory Quality Assurance Data Summary

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Most of the laboratory duplicate pairs had no detectable levels of VOCs. The precision for Method 601 compounds ranges from 6% relative percent difference (RPD) for dibromochloromethane (1.6 µg/l and 1.7 µg/l) to 80% RPD for TCE (2.7 µg/l and 6.3 µg/l) for paired duplicate values. For Method 8020 compounds, the range is 5% RPD for benzene (2.1 µg/l and 2.0 µg/l) to 40% RPD for toluene (10  $\mu$ g/l and 6.7  $\mu$ g/l). Generally, precision increases (RPD decreases) as concentration increases above the limit of quantitation (LOQ). The LOQ is calculated statistically and represents the concentration above which an analyte may be measured quantitatively with a greater degree of confidence. convention is for LOQ =  $10 \times S_0$ , where  $S_0$  is the estimate of the standard deviation of the lowest level of measurement (noise). For the purposes of this discussion, the LOQ will be considered to be five times the method detection limit for a specific analyte, which is a generally accepted standard. The laboratory objective for precision is <15% RPD, which is met by approximately half the duplicate pairs, for a completeness value of 50% (completeness = acceptable measurements/total x 100%). However, due to the small number of useable data points, the precision estimate may not be representative of the true analytical precision.

Matrix spike sample data indicate very good accuracy, with average recoveries ranging from 87% to 112% for Method 601 compounds and 94% to 100% for Method 8020 compounds.

#### o Anions, Standard Method 429

The QC data for anion analysis indicate excellent accuracy and precision. The method blanks showed no detectable concentrations of anions. Precision for the majority of the duplicate pairs is 0% RPD, and the percentage of paired values meeting laboratory QA objectives for precision is 98% (completeness).

Matrix spike data range from 88% to 98% average recoveries, indicating excellent accuracy: 100% of the data meet laboratory QA objectives for accuracy.

# o Total Dissolved Solids (TDS), EPA Method 160.1

None of the method blanks for TDS analysis showed detectable concentrations, and the duplicates showed good precision, with a completeness value of 86%. Only one matrix spike was analyzed. It had a 94% recovery.

#### o Carbonate, Bicarbonate and Hydroxide Alkalinity

The method blanks for alkalinity were below detection for carbonate, bicarbonate, and hydroxide alkalinity. Duplicates were analyzed for bicarbonate alkalinity only and showed good precision with a completeness factor of 91%, which meets the QA objectives. Matrix spikes were prepared for bicarbonate only and indicated good accuracy, with a completeness factor of 100%.

#### o Minerals and Metals by ICP and AA Methods

The analytical precision for the metals and minerals analyzed by inductively coupled argon plasma spectroscopy (ICP) and atomic absorbtion spectrophometry (AA) was very good, based on the laboratory duplicate data. ICP analysis was for calcium (Ca), iron (Fe), magnesium (Mg), sodium (Na), manganese (mn), barium (Ba), cadmium (Cd), chromium (Cr), lead (Pb), and silver (Ag). AA analysis was for arsenic (As), selenium (Se), mercury (Hg), and potassium (K). Elements such as Ba, Ca, Mg, K and Na, which commonly occurred in the samples at concentrations well above the limit of quantitation (LOQ), had RPD values within laboratory QA objectives. Other elements detected at much lower concentrations (Fe, Mn) showed worse precision. As, Se, Hg, Pb, Cd, and Ag were consistently undetectable in the samples.

Laboratory method blanks showed detectable levels of calcium and sodium that were significantly lower than their concentrations in the samples. These ina; be artifacts resulting from spectral interferences or instrument background problems, but do not affect the usability of the data. However, chromium and iron were detected in most of the method blanks at

concentrations near or below the LOQ and comparable to levels reported for samples. Since chromium was detected in all of the samples at levels similar to those in the method and field blanks, chromium is definitely an artifact and should not be considered significant. This is also true to a lesser extent for iron, although some samples contain elevated concentrations of this metal and should be considered "real."

#### h. Miscellaneous Parameters

Because of the small number of samples requiring analysis of cyanide, total petroleum hydrocarbons and total phenolics, there is insufficient QC data to evaluate the reliability of these methods.

## 3. Laboratory Audit

In March 1987, an AV audit team will conduct a comprehensive system audit of the Acurex laboratory in Mountain View. A similar audit was conducted by AV in April 1986. The goals of these audits are:

- To evaluate the laboratory's methods and procedures relating to the analysis of Air Force IRP samples to ensure that resulting data were true and valid.
- o To identify areas that could be improved and to recommend measures to improve the quality of data for IRP samples.
- o To maintain and improve the exchange of information and ideas between Acurex and AV to assure the Air Force of a better product.

The results of the March 1987 audit will be reported in the second draft of the Stage 3 report.

# F. Reliability of Sampling

#### 1. Field Methods

Groundwater samples taken during the Mather AFB field program were collected using a 1-7/8 inch stainless steel bailer. In sampling groundwater for sensitive analytical parameters such as volatile organic compounds (VOCs) and heavy metals, it is important that the methodology does not alter the composition of the sample chemically or physically. The following factors will impact sample integrity:

- a. The adsorption of materials from or the leaching of materials into the sample by the sampling equipment.
- b. A change in the pH state or the reduction or oxidation potential of the sample, potentially causing precipitation of dissolved minerals.
- c. Degassing of VOCs from the sample as a result of aeration or pressure drops.

The stainless steel and Teflon construction of the sample bailer and transfer bucket minimizes the potential for adsorption of organics and for the introduction of contaminants into the sample. All sampling personnel coming into contact with the sample wore disposable latex gloves, and direct sample contact was avoided. Decontamination of the bailer, bucket and funnel included rinsing them with two bailer volumes of sample water before collection.

All wells were sampled for minerals (sodium, calcium, magnesium, manganese, iron, potassium); several wells for heavy metals. To minimize oxidation and precipitation, the sample was handled gently to avoid splashing, which could aerate the sample during transfers from the bailer to the transfer bucket and from the transfer bucket to the pressure filtration apparatus. Purified grade nitrogen was used in filtering to prevent oxidation. Samples were filtered directly into high density polyethylene bottles and immediately acidified.

Since the elements in their dissolved form were of interest, the sample was filtered through a 0.45 micron membrane immediately after collection. The 0.45 micron pore size has been shown to be optimal for this purpose, as smaller pore size filters yield no significant difference in chemical composition (EPA, 1982b) Proposed Sampling and Analytical Methodologies) and are not practical for use in the field due to their slower filtering rate.

The potential for degassing volatile organics during sample collection with a bailer can be relatively high; during the Mather AFB sampling program several steps were taken to minimize this potential. The bailer was lowered into the well gently to prevent agitation, and VOA samples were taken from the first bailer by gently pouring the water into 40-ml vials.

## 2. Field Quality Assurance Data

Based upon the field QA/QC sample data, the quality of the Mather data package is good. The overall precision of the measurement system (sampling, packaging, shipping, analysis, reporting) is estimated from the results of blind field duplicate (or "split") analyses. The potential for sample contamination from sample collection, transport, or analytical error may be evaluated from field blank sample results. The accuracy or bias of the total measurement system could not be evaluated, because field spike samples were not included in the scope of work for this investigation. The selection of groundwater duplicates for the first sampling round was based upon suspected contamination and field observation, at a rate of 10% of the total number of samples collected. For the second round, field duplicates were selected to include samples known to be contaminated, based upon the first round results, in order to evaluate precision at levels above the level of quantification, which is typically five times the detection limit. One field blank was prepared for every twenty groundwater samples collected.

Field QA/QC sample results are shown in Table M-2. For duplicate pairs, the precision is expressed as relative percent difference (RPD), calculated using the following equation:

TABLE M-2. Field Quality Assurance Data Summary

HO. AND BOLD FIELD DUPLICATES UG L

PAIRED TUPLITATE SAMPLE IDS	TINTL CHLORIDE	P P D	1 1-DCA	RPD :1 2	-DCA RPD	TCE	RPC   PCE	29.8
76; 76; 76; 77)		;	******			200 200	104:	•••••
790 74. 799 794 607 608	9 9 9 4		3 9 2 9 MD 0 9		5 2 4 414	:: :: 36 64	54 568 -	
629 0 50 640 64. 651 652		1				25 35	23 25	
658 659						.,		
601 AND 8020 FIELD CUPLICATES			1 2-DICH		-DICHLORG			
******************	; ;-pcP	RPC	BERZERE	APD IBER	118E 87D	tofnese.	RPC XYLEMES	270
761 762 769 773 793 791 798 799	1 1 2	: 4 4	3 3 3	10%. 3	3 3 10%	2 8 2	334 3 #0	

ANIONS FIELD DUPLICATES

PAIRED SAMPLE 10s	SPOMICE RPO	SHESRICE RPC	FLUORIDE RPD	MITRATE RPS	MITRITE REC	PHOSPHATE PF:	
19375, 300763			1 2 2 3 2 3 4	2 3 2 3 04	NO RE	SC NE	
353764 333763	NE 75					NO NO	
							·
16279) 30079.	1 1 2 1 3	<b>4</b> 3 8 4 51	1 0.2 0 2 21	D 1 3 1 4 7 74	MC ME	RC NT	
100798 000799	3 -9 5 69 3	1 49 7 99 61	ND 0.1	14 15 78	NO NO	40 90	
100401 000408	3 2 3 2 3	<b>1</b> 6 7 6 8 21	NO NO	4 4 21	ME ME	MI NI	· · · .
111624 110631	NE NE	11 11 31	92 2 1	NC NO	NO NO	NO NO	
1.0541 000541	3 2 3 2 3:	<b>6</b> 22 21 51		3 6 3 6 3 8	NO NO	MC NC	
000651 000650	NO NO	1 2 3 1 31	0 2 3 3 464	O 3 2 3 4 6 68	NO NE	NE NE	
000058 000054	ME NE	6 6 31	. 62 52 24	1 8 1 8 0	NO RE	NI NI	

MINERALS FIELD DUPLITATES

SAMPLE ID	DUP	SAMPLING ROUND	2.0	ЯРС	*•	RPC		40	RPE	Mn	RPC		,	P P 1	N	-
***********	763		16 16		12 0 016			5 4	24 0 001	2 2 2 2 2 5	50%	1 1	,	; t	••••••	
		i	14 14		28 3 035		3 40		IN NO	M.C.	,,,,	2 5	; ;	8.4	14	
- 3 3	- 9 .		5 5 5 5	24.3 3	57 0 934	511	: 8	: 5	ON NO	N D		5 ;	5 2	2.4	1.	
~ 9 8	799	1	37 37	34 :	32 0 29	131	: *	: *	0 % 0 1 1	3 3 13	0.8	1 6	. 4	134	1.5	
+ 2 7	~ ^ 8	:	21 23	5 0 0	14 3 14	0 1	1.1	1.1	0 4 0 0 6 2	: : :6:	2.1	1.6	. 4	2.2 %	: -	
F 2 9	630	:	8 " 8 2	61 0 3	13 0 015	423	2 4	2 9	* #5	M C		3	4 7	111	1.9	
640	541	:	43 45	5 4 3	18 5 17	6 1	23	2.4	4% 0.093	3 5 597	41	1 -	. 8	6	. •	
	552	:	~ 6 ~ 5	1000	33 0 . "	1354	3 5	3 5	31 3 13		8 1	1 5	. 4	- •	• :	
e 5 B	653	4	13 14	** 3	02 0 04	6.1	5 6	5 5	24 0 11	: ::		: -	. 5	124	1:	

METALS FIELD DUPLICATES

19, 19: 1 NO NO GOEGO 2:3 1294 NO NO COSE 0.02 114 136 1394 1 NO NO COSE 0.11 10:55 104 NO NO NO COSE 0.01 2:14 6:0 65: 2 NO NO COSE 0.14 0.1 184 NO NO COSE 0.11 2:14	SAMPLE IC	009 10	SAMPL ROUND		A.B.	348		8.	RPD		: a	RPC		î r	PPE
	٠, ٠	79:	:	NO	N D		5 0 8 8	2 314	1294	# D	# 2		0 0:0	3 32	114
640 641 2 ND ND 022 01 75% ND ND C046 0 G13 21%	9.29	631	:	90	N.D		2 244	٠.	*81	N C	NE		3 11	2 219	5.1

SAMPLE ID		SAMPLING ROUND	*		RPD	P	-	RPC .		•	RPC	Aş		P P :
	74.													
• 3	٠.		ND	MD		R C	M.C		#I C	N C		M C	S E	
~ 3.5			ND	N O		ND	W.C		NC	R D		N C	3 19	
6.17	6.30		NC	ND		N D	# C		15 D	M C		N C	N C	
1.1														

GENERAL INORGANIOS FIELD DUPLICATES MG L

		BITAR	BONA	7 E	CARBO	MATE		TOTAL						TOTAL	
PAIRES	SAMPLE CO	ALFAL		RPC	ALFAL			PHENOLS		RPC	TOS		PPC	SYASIS	
	:14: 33314;	+ 5	-:	٠,	N.C	ЯD		7A				. 33		NA.	NA.
000	3769 363763	+ 4	5.0	669	ND	2.2		MA	M A		1.15	. 6	213	4.4	4.2
	, 193 USS 193	5:	6.0	: 1			0.4	0 0:4 :	146	6.3.6		. 11	1.4	N.C	W :
	1798 - 111799	151	: 5 .	0.4	N D	<b>#</b> 5		NA.	4.4		. * 3	100	1.3	N:	N C
	ind To about be	9.4	: 30	1.74	N.C	NO		N.A.	MA		1.71	192	2.4	MA	MA
000	14. <b>29</b>   \$60435	5.	5 9	1 %	9.0	₩ Đ		M A	9 A		9.0	8 *	5.1	NL	M C
	:441 0035 <b>4</b> 1	2::	3 + C	488	N D	# D		RA	# A		100	: 6 :	- 1	40	N:
	165. 163651	4.3	4.7	4.4	₹ 5	N D		N A	A K		146	1.40		N A	N A
3.10	0+58 000h54	2.4.1	140	31	*D	# C		N A	4 4		2:0		0.4	MA	* A

NA - N T ANALYZES

# TABLE M-2. (con't)

#### 40; ABD 8020 FIELD BLANKS UG L

SAMPLE BOURD SAMPLE ID	C#2C1			C13			
14: BOURD							 
***				2	1	<b>#</b> D	1
221021	:	4		5		#D	
ind Rooms							
000636	3	9				3	
000460	G	,	:	9		<b>■</b> D	4

# GENERAL INORGABICS FIELD BLAKES - MG L

SAMPLE ROUND SAMPLE IC	BICARBOHATE ALEALIHITY	TOTAL PHENOLS	TDS	TOTAL CTABLDE
ROUNC 1				
000871	:	<b>#A</b> 0 03	11 80	#A
ROUND 1				
233n36 233662	R D R D	EA EA	N D	#D

NA - NOT ANALYZED

#### MINERALS FIELD BLANKS HG L

SAMPLE IS	ROUNE	:•	7.	N 9	×n	K	f.	_
8C; 636 660	1 1 2 2	0 18 0 6 0 29 0 19	0 032 0 022 0 026 0 022	0 048 0 13 2.75	PD RD RD	#E 0 04 0 04 #E	0.76 0.5 0.69 0.75	•

#### METALS PIELE BLANKS US L

SAMPLE ID	ROUND	A 5	8.	: 1	ī r	R q	Pb	5 0	A:
83;	:	NC.	0 3;	<b>7</b> 0	2 023	# C	# C	#D	Ψč
A 1 A		N D	2 2 1	# 5	4 6 2	<b>B</b> C	πċ	38	N E

#### ANIONS FIELD BLANKS MG L

SAMPLE ROUND SAMPLE ID	ALL ARIONS CONCERTRATION	MG. L
ROUNE 1		
335772 231 <b>6</b> 31	ND ND	
ROUND :		
223636 225663	NC 80	

RPC * RELATIVE PERCENT DIFFERENCE

WHERE XI AND XI ARE PAIRED DUPLICATE VALUES

NO + NOT DETECTED AT HOL X DETECTION LIMIT FACTOR

RPD = 
$$\frac{|X_1 - X_2|}{(X_1 + X_2)/2}$$
 x 100%

where  $X_1$  and  $X_2$  are paired duplicate values.

QA/QC sample results are discussed below by parameter.

# a. Volatile Organic Compounds (VOCs) EPA Methods 601/8020

Precision for VOC analysis is difficult to assess, as most of the VOC paired duplicate results are less than the limit of quantitation (LOQ), which is typically five times the method detection limit (MDL). Since the MDL for all VOC compounds is 0.5 µg/l, the LOQ is approximately 2.5 µg/l. Trichloroethene (TCE), the most common compound found in Mather groundwater samples, was detected in four duplicate pairs at concentrations above the LOQ. The precision for TCE paired values ranged from 9.5% RPD to 56% RPD. This is comparable to the laboratory precision of 9% to 80% RPD, based upon three quantifiable laboratory duplicate pairs, indicating no significant loss of precision due to sampling error.

Duplicate precision appeared to be independent of analyte concentration. Generally, precision, or reproducibility, increases with increasing concentration, although that trend was not observed with these data. For example, two field duplicate pairs had detectable concentrations of tetrachloroethene (PCE), with paired values 2.7/2.6 µg/l (3.8% RPD) and 7.7/18 µg/l (80% RPD). Since field duplicate data provides an estimate of precision for the entire measurement system, field sampling errors cannot be distinguished from analytical errors.

The available field duplicate data show acceptable precision for VOC analyses, although insufficient data are available to assess the precision with a high degree of confidence.

The field blank VOC samples showed no significant evidence of potential sample contamination. Chloroform was found in all four blanks, ranging from 1.9 µg/l to 4.8 µg/l. This contamination was traced back to the reagent water used in preparing the blank samples and was not contributed by the sampling, shipping or analysis activities.

## b. Total Dissolved Solids (TDS), EPA Method 160.1

Precision for TDS analysis was very good, based upon field duplicate data. Field duplicate precision was comparable to laboratory duplicate precision, indicating no significant field induced sampling error. One field blank sample had a reported concentration of 11 mg/l TDS, which, compared to the MDL of 10 mg/l, does not represent significant sample contamination. The other three field blanks had no detectable TDS.

All of the TDS samples were analyzed within the EPA-specified 48-hour holding time with the exception of four: sample Nos. 000775, 000798, 000799, and 000800, which had holding times of three days. TDS data for these four samples is not considered valid, but are included in the data tables in Appendix N for comparison purposes.

#### Anions, Standard Method 429

Overall precision for anion analysis was excellent. The relative percent difference (RPD) values for paired duplicate results were less than 10% in all but one case. This is comparable to the laboratory precision, which was also excellent. No detectable concentration of the seven anions of interest (C1⁻, F⁻, Br⁻, NO⁻₂, NO⁻₃, SO⁻₄, PO⁻₄) were found in any of the field blank samples.

All of the anions samples were analyzed within generally accepted holding time guidelines (Method 429 does not specify holding times) with the exception of nitrate/nitrite and phosphate. The most stringent guidelines available are from EPA Method 300.0, which specifies a 48-hour holding time for nitrate/nitrite and phosphate. Although this method was not used, the holding time guidelines will be followed to ensure the validity and comparability of the data. The following samples exceeded the 48-hour holding time for the three aforementioned anions: sample Nos. 000651-000657, 000775, 000784, 000798-000800. The nitrate/nitrite and phosphate data for these samples are not considered valid (they were analyzed three days after collection) but are included in the data tables in Appendix N for comparison purposes, and were also used in the anion-cation balance calculations (trilinear diagrams).

## d. Metals and Minerals, ICP and AA Methods

Overall precision for minerals and metals paired field duplicates is very good, especially for elements detected at levels above the LOQ. The RPDs for naturally occurring elements calcium, magnesium, manganese, potassium and sodium were all below 15%. Precision for elements detected at concentrations very near the MDL was not as good; these included iron and barium. This is the expected trend, in which precision increases with increasing concentration.

Chromium was detected at approximately 0.02 mg/l in all samples, including field blanks and laboratory blanks; it is suspected to be an artifact. Barium and iron, more commonly occurring elements, were also detected in the field blanks at concentrations similar to those reported for the samples, but were well below existing water quality criteria.

#### e. Alkalinity, Standard Method 403

Bicarbonate is the only detectable alkalinity parameter in the field duplicate samples and shows acceptable precision based upon RPD values from paired duplicates. Field blanks from the first round of sampling both had reported concentrations of 4 mg/l, which is small compared to the average bicarbonate value in the samples. No detectable concentrations were reported for the blanks from the second round.

## f. Miscellaneous Parameters

Few field QA/QC data are available for cyanide, total petroleum hydrocarbons and total phenolics due to the small number of samples. Therefore, no conclusions may be made concerning the reliability of the measurement system. The single total phenolics field duplicate had an RPD o: 63%, which is inconclusive, especially since no laboratory precision data are available for this parameter.

## G. Summary

The overall quality of the analytical data package is good based on field QA/QC sample data. Insufficient data were available to assess the overall precision for the low frequency parameters (total phenolics, total petroleum hydrocarbons, cyanide). The precision of the volatile organic analyses for the overall measurement system, based on field duplicate data, is comparable to the laboratory precision, which indicates reliable sample collection, packaging and shipping activities. The metals and minerals QA/QC data indicates that chromium and iron may be artifacts, but because of the very low levels involved, the significance of these elements is negligible. The field duplicate and blank data for the anions show the quality of these measurements to be excellent.

## APPENDIX N

Sample Results Tables

Groundwater sampling results for Well MAFB-01 at Mather AFB, California ACW DISPOSAL SITE TABLE N-1.

	1						
	76	Round 1 11/12/86 1 762 (Duplicate)	Round 2 12/13/86 656		761	Round 1 11/12/86 1 762 (Duplicate)	Round 2 12/15/86 656
60l Results (ug/l)		2 1 1 1 1	1	Alkalinity Results (mg/l)	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	4 4 2 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4
(3) - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	•	:	;	i			
uniorometrane Bromomethane Dichlorodifluoromethese	2 2 2	229		te Alk. Alk.,	0N ND	17 UD	6.4 UD
Vinyl chloride	ON ON	S S	Q Q	Hydroxide Alk., as CaCO3	ND	ND	Ñ
Chloroethane Methylene chloride		ND 17.8	ON CN	Analysis date:	11/12/86	11/21/86	12/1./86
Trichlorofluoromethane 1,1-Dichloroethene		QN	GN GN	429 Results (m. 27.1)			
1,1-Dichloroethane	Q	2	QN	11/ha carres (17/1)			
trans-1,2-Dichloroethene	9	ON C	ON S	Bromide	0.1	0.1	ÛN
1.2-Dichloroethane		Q N	ON ON	Chloride	3.5	3.2	3.4
1,1,1-Trichloroethane	QN	QN QN	<u> </u>	<b>5</b> 7	0.7	2.0	0.5
Carbon tetrachloride	QN:	QN	QN	2	ON.	, (IN	# GN
bromodichioromethane 1,2-Dichloropropane	QN QN	Q Q	O Z	Phosphate, as P Sulfate	ND VD	Û,	ÎZ,
trans-1,3-Dichloropropene	QV	Q	Q.	מזומים	<del>-</del>		^.; • <del>••</del>
Trichloroethene	077 CW	700	790	Detection limit factor:	1	-	
1,1,2-Trichloroethane	QN	Q.	N N N N N N N N N N N N N N N N N N N	Analysis date:	11/13/86	11713786	12/16/86
cis-1,3-Dichloropropene	2	<b>Q</b>	S	;			
Bronoform	2 2	20	Q Q	Total Dissolved Solids (mg/l)	130	1 30	190
1,1,2,2-Tetrachloroethane	ON S	2	QN	Detection limit factor:	- :	1	-
Chlorobenzene	2	9	QN:	nialysis uace:	11/13/86	11/13/86	12/15/86
	Q.	ğ	Q.	Mineral Results (mg/l)			
_	10	10	10				
Surrogate Recovery, & Analysis Date:	98/21/11	103	67	Calcium, Ca	16	16	16
		00 // // / /	00/77/71	Magnesium, Mg	0.032	0.036	0.22
					0.003	0.005	7 (Z
BOZO RESULTS (UG/1)				Potassium, K	1.1	1.2	2.1
Benzene	QN	QN	QN	See Land Medical	9.P	9.1	9.1
Chlorobenzene	CN:	2	Q :	Detection limit factor:	1	-	J
1,7-Dichlorobenzene 1-3-Dichlorobenzene	2 2	Z 2	2 5		01/20/87	01/20/87	01/21/н/
1,4 -Dichlorobenzene	Q	Q	QN QN	Analysis date (K):	01/19/87	01/19/87	01/19/8/
Ethylbenzene	2	<u> </u>	QN :				
loldene Total Xylenes	G X	S N	Q QN	Footnotes:			
•				a: below normal laboratory background	)d		
Detection limit factor: Surrogate Recovery, %	10 99	10 103	10 65	:			
				it confine ation not performed			
Analysis Date:	11717786	11/17/86	12/23/86	(Note: these definitions are not repeated on subsequent tanger)	ated on subse	quent tables)	

* Data for nitrate/nitrite invalid, holding time exceeded

Groundwater sampling results for Well MAFB-02 at Mather AFB, California - ACW DISPOSAL SITE TABLE N-2.

**}** 

	Round 1 11/12/86 764	127 127 658 (Du	Round 2 12/14/86 58 (Duplicate)		Rou 11/1	. 69	Round 2 12/14/86 8 (Duplicate)
601 Results (ug/1)	14 11 11 11 11 11 11 11 11 11 11 11 11 1		\$ -4	Alkalinity Results (mg/l	त । १ व व व व व व व व व व व व व व व व व व व	f 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ;
Chloromethane Bromomethane	Q Q N	ON N	ON	Bicarbonate Alk., as CaCO3 Carbonate Alk., as CaCO3	120 ND ND	140 ND ND	040 NE
Dichlorodifluoromethane Vinyl chloride Chloroethane	Q Q Q	ON N	Q Q Q Q	Analysis date:	11/21/86	12/17/86	12/17/86
Methylene chloride Trichlorofluoromethane	ND ON		O CI ON	429 Results (mg/l)			
1,1 Dichloroethane trans 1,2-Dichloroethene	Q Q S	999	ON O	Browide Chloride	0.18.5	ND C	₩ Đ
Chloroform 1,2-Dichloroethane	28		9	Fluoride Nitrate as N	0.3	. e 	ः इ च <del>–</del>
1,1,1-Trichloroethane Carbon tetrachloride	Q Q N	<u> </u>	229	Nitrite, as N	QN CN	NI) NI)	È.
Bromodichloromethane 1,2-Dichloropropane	Q Q Q			Phosphate, as F Sulfate	53	18	1.1
trans-1,3-Dichloropropene Trichloroethene Dibromochloromethane	23.2 W 8.3 W 8.0 W	ND 25 ND ND	0 3 8 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Detection limit factor: Analysis date:	1 11/13/86	12/16/86	12 16 86
1,1,2-Irichioroethane cis-1,3-Dichloropropene 2-Chloroethylvinyl ether			QN QN	Total Dissolved Solids (mg/l)	9/1) 230	210	517
Bromoform 1,1,2,2-Tetrachloroethane Tetrachloroethene	3 N Z N			Detection limit factor: Analysis started:	11111186	112/15/86	12715-86
Chlorobenzene Dichlorobenzenes	G.	Q.	QN	Mineral Results (mg/l)			
Detection limit factor: Surrogate Recovery, % Analysis Date: 8020 Results (ug/1)	5 107 11/17/86	2.5 98 12/23/86	1 101 12/23/86	Calcium, Ca Iron, Fe Magnesium, Mg Manganese, Mn Potassium, K	12 1 5.4 0.15 1.9	0.02 6.02 6.13 0.13 1.13	6.0 6.0 7.3 7.3 7.1 8.1
Benzene Chlorobenzene 1,2 Dichlorobenzene 1,3 Dichlorobenzene 1,4 Dichlorobenzene Ethylbenzene Toluene		S S S S S S S S S S S S S S S S S S S	UN N N N N N N N N N N N N N N N N N N	Detection limit fact. Analysis date (ic) Analysis date (K.)	1 01:20:87 01:19:83	01/21/87 01/19:87	01 21 H 2 01 13 H 3
Detection limit factor: Surrogate Recovery, %	201 201		- z				
Analysis Date:	11-17/36	12:23:586	12.25.86				

Groundwater sampling results for Well MAFB-03 at Mather AFB, California - ACW DISPOSAL SITE N-3. TABLE

	Round 1 11/11/86 758	Round 2 12/14/86 661		nd 17 58	Round 12/14/
601 Results (ug/1)	16 16 16 16 16 16 16 16 16 16 16 16 16 1	ा । । । । । । । । । । । । । । । । । । ।	Alkalinity Results (mg/l)	ananananananananananananananananananan	. 내 내 내 내 내 내 내 내 내 내 내 내 내 내 내 내 내 내 내
Chloromethane Bromomethane Dichlorodifluoromethane		CN CN CN CN	Bicarbonate Alk., as CaC03 Carbonate Alk., as CaC03 Hydroxide Alk., as CaC03	26 ND ND	47 ND ND
Vinyl chloride Chloroethane Methylene chloride	ND ND 110 a	ON ON ON	Analysis date:	11/21/86	12/17/86
Trichlorofluoromethane 1,1-Dichloroethene	QQ	QN N	429 Results (mg/l)		
1,1-Dichlorocthane trans-1,2-Dichlorocthene Chloroform		202	Bromide Chloride	0.1 4.4	ND 3.4
1,2-Dichloroethane	2	2	ŧ	S. O. F.	4.0
1,1,1-Trichloroethane Carbon tetrachloride	2 R	<b>Q</b>	zz	QN	<b>. .</b> .
Bromodichloromethane 1,2-Dichloropropane	Q Q	QQ:	Phosphate, as P Sulfate	3.2	ND 1.6
trans-1,3-Dichloropropene Trichloroethene Olbromochloromethane	0 6 N N	ON E ON E ON E	Detection limit factor: Analysis date:	1 11/12/86	1 12/16/86
cis-1,3-Dichloropropene 2-Chloroethylvinyl ether	<b>199</b> !	<b>9 9 9</b>	Total Dissolved Solids	(mg/1) 120	110
Bromoform 1,1,2,2 Tetrachloroethane Tetrachloroethene Chlorobenzene			Detection limit factor: Analysis date:	1 11/12/86	12/15/86
Dichiorobenzenes	2	ON !	Mineral Results (mg/l)	•	
Detection limit factor: Surrogate Recovery, % Analysis Date: 8020 Results (uq/l)	50 123 11/17/86	2.5 92 12/23/86	Calcium, Ca Iron, Fe Magnesium, Mg Manganese, Mn Potassium, K	6.2 2.2 2.1 0.58 0.8	9.8 0.16 3.4 0.55 0.94
Benzene	Q	QN.	Sodium, Na	\. <del>.</del>	9
Chlorobenzene 1,2 Dichlorobenzene 1,3 Dichlorobenzene 1,4 Dichlorobenzene Ethylbenzene Toluene	9959999		Detection limit factor: Analysis date (ICP): Analysis date (K):	01/20/87 01/19/87	01/21/87 01/19/87
Detection limit factor: Surrogate Recovery, %	50 123	2.5 88			
Analysis Date:	11/17/86	9875771			

Groundwater sampling results for Well MAFB-07 at Mather AFB, California 7100 DISPOSAL AREA N-4. **LABLE** 

	Round 1 11/1//86 792	Round 2 12/11/86 6.37		_	Round 2 12/11/86 4.37
601 Results (ug/1)	17 日本 日本 日本 日本 日本 日本 日本 日本 日本 日本 日本 日本 日本	1	Atomic Absorption Hetal Results (ug/1)	Results (ug/1)	
Chloromethane	G Z Z		Arsento, As Mercury, Hg	Û	CIN
chlorodif luoromethane	2	2	Selenium, Se	Î	2
loroethane	2 4 4	125	Detection Hait factor: Analysis date (As.Hu):	11726786	12/17/96
1chlorof luoromethane		25	Analysis date (Se):	12/01/86	17/1//86
Dichlorocthane   Dichlorocthane	22	99	Alkalinity Results (mq/1)	2	
loroform	21	<u> </u>	Becarbone Alk Andreas		0 🗣
2 Dichloroctuane 1,1 Trichlorocthane	229	99	Carbonate Alk. as (a(0)	ON CO	<del>g</del> g
rbon tetrachioride omodichloromethane	22	<u> </u>		76.16.71.	30,71,71
1,2-Dichloropropane trans 1,3 Dichloropropene	<u> </u>	<u>e</u> e	Analysis date:	11/7/100	20, 1, 1, 1, 1
Trichloroethene	2 2	윤윤	429 Results (mg/1)		
1,2 Trichloroethane	2	<b>E</b> 1		2	3
e 1,3 Dichloropropene	2 2	<u> </u>	Chior ide	22	0.7
	2	9	Fluoride	2	
1,2,2 Tetrachloroethane	2	<u>e</u>	Z. (1) (1) (2) (2) (2) (3) (3) (3) (3) (4) (4) (4) (4) (4) (4) (4) (4) (4) (4		
trachloroethene lorobenzene	2 2	2 6	Phosphate, as P	e e	GN .
Dichlorobenzenes	Û	<u>Q</u>	Sulfate	260	0 \$ 7
Detection limit factor: Surrogate Recovery, % Analysis Date:	10111721786	1 75 127.227.86	Detection limit factor: Analysis date:	1 11/18/86	12/17/86
			Total Cyanides (mg/1)	ÛN	ON
8020 Regults (ug.1)			Detection limit factor:	-	-
Benzene Chlorobenzene	G GR	<u>8</u> 9	Analysis date:	11/26/86	12/19/86
2 Dichlorobenzene	2	<u>ş</u> ş	Total Dissolved Solids (mg/1)	1/1) 890	800
A Dichlorobenzene	9	Ê			•
Ethylbenzene Toluene Total Xylenes	<b>223</b>	CIN CIN CIN	Detection limit factor: Analysis started:	1 11718:86	12712.86
Detection limit factor:	101	1 7.	Metal Results (ug/l)		
יייי איייייייייייייייייייייייייייייייי			48 6:1748	931	ć
Analysts Date:	11 21/86	12. 22.86	Cadmium, Cd Chromium, Cr Lead, Fb Silver, Ay	Q ♥ Q Q	
			Detection limit factor: Analysis date (Ba): Analysis date (Othersi:	1 01:21:87 01:20:87	1 01/21:87 01/21/87
			Mineral Results (mg/l)		
			Calcium, Ca Iron, Fe Magnestum, Ma	0.1.2 1.3.4	0 <b>9</b> 1 091 8°3
			Manganese, Mn Fotassins, K Sodius, Na		e
			Fortection limit factor. Analysis date (16) Analysis date (8)		18 17 10

Groundwater sampling results for Well MAFB-08 at Mather AFB, California - 7100 DISPOSAL AREA N-5. TABLE

Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Attachment   Att		Reduct 1 11716/86 787	Round 2 12709786 614		Round 1 11/16/86 787	Round 2 12/09/86 614
Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marcary   Marc	601 Results (ug/1)			Atomic Absorption Metal	Results (ug/1)	1
10   10   10   10   10   10   10   10	Chloromethane	2	21	Arnenic, As	Q.	Q
Detection list factor:   11.26/86   12.17	difluoromethane 4	26,		Mercury, My Selenium, Se	<b>2 2</b>	
Manayara date (Ma.149)   11/26/86   12/19	loride + hane	CIN C	7.7 Mg	Detection limit factor:	-	
Main	chloride of luoromethane	<u>e</u> e	<u>e</u>	Analysis date (As.Hq): Analysis date (Se):	11/26/86	12/17/86
	oroethene	25	2	•		
Bicathonate Alk, as (aco)   110	Dichloroethene	2 6	2 5	Alkalinity Results (mg/)	-	
10	B or oet hane		<b>2 2</b>	Bicarbonate Alk as CaCol		036
10	chloroethane		29	Carbonate Alk., as CaCO3	9	2
10	loromethane		2	COLOR DE COMPLET PRINCIPAL		2
1.0	oropropane : Dichlorupropene		<b>2 2</b>	Analysis date:	11/71/86	12/16/86
Microside	ethene Joronethane		<u>= 8</u>	4.29 Repults (mg/l)		
The control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the	chloroethane		€!			
	Mchloropropene thylvinyl ether			Oronide Objected	0.3	<del>4</del> .0
Mitties as H   No.4			9		2	€ €
1	Tetrachloroethane 2		€ -	Zirete, be Z	• •	- 1
MD   MD   Suffice   48	nzene		<u>.</u>	Phosphate, as F	2 2	
1   124   Analysis date:   11/17/86   12/10/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/87   12/12/86   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/1	benzenea	ê	Ē	Sulfate	<b>8</b>	180
11/21/86   12/12/86   Total Cyanides (mg/1)   MD		-:	-:	Detection iimit factor:	- ;	-
Total Cyanides (mg/1)  1.0  1.5  Analysis date:  MD  MD  MD  MD  MD  MD  MD  MD  MD  M	Date:	11/21/86	98/71/21	Analysis dete:	11/1//86	12/10/86
1.5   Analysis date:	Beautiful Committee			Total Cyanides (mg/1)	Ç	Ē
17.20.70	, ho	-		Detection limit factor:	- 3	-
MID	zene	0.7	0.7	Analysis date:	11,26,86	12/19/86
MD	orobenzene	<b>9 9</b>		Total Dissolved Solids (mg/		\$60
1	orobenzene	2	€ €		•	•
1	lenes	222	200	Detection limit factor: Analysis started:	11/17/86	12/10/86
11.21.86   Cadelum, Cd   ND   ND	a limit factor.	- 1.	124	Metal Results (ug/1)		
Chromism, Cr.  Lead, Pb  Silication thank factor:  Analysis date (Bal:  Analysis date (Others):  Mineral Results (mq 1)  Calcina, Fa  Haydenesium, Fq  Haydenesium, Fq  Haydenesium, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Calcina, Fq  Ca		90 11		Serion, Se	5 (	9
factor: 1 01.21.67 01.21.67 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01.20.00 01		88 × 19 × 11	38 : 71 : 71	Chromium, Cr Chromium, Cr Lead, Pb 911ver, Aq	2 2 2 6	2 = 2 (
01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20 01/20 01/20 01/20 01/20 01/20 01/20 01/20 01/20 01/20 01/20 01/20/87 01/20/87 01/20/87				Date and the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control	} -	•
25 25 0 11 0 11 14 0 0 11 14 14 14 14 14 14 14 14 14 14 14 14				Analysis date (Ba): Analysis date (Others):	01/21/87	01,21787
25 0 11 0 11 0 0 08 1 9 1 9 1 9 1 9 1 9 1 9 1 9 1 9 1 9 1 9				Mineral Results (mq. 1)		
14 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				Calefum, Co	\$3	6
(B) (B) (B)				Magnestium, Mg Mandanese, Mn Potassium, K Sodium, Na	## 88 ° 81 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
				Peter ( for 1 581) (as tot.) Analysis date (175)	1 20.40	

Groundwater sampling results for Well MAFB-09 at Mather AFB, California - 7100 DISPOSAL AREA N-6. TABLE

	Found 1 11/16/16 789	Round 2 12.11/86 631		Round 1 11/16/86 789	Round 2 12.11/86 631
601 Results (ug/1)	The second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second secon		Atomic Absorption Metal Results (ug/1)	Results (uq/1)	105 127 138 148 148 148 148 148 148 148 148 148 14
hloromethane romomethane ichlorodifluoromethane		CIN CIN CIN	Armenic, As Mercury, Hy Gelenium, Se		GN GN UN
Vinyl chloride Chloroethane Methylene chloride Trichlorof Lucromethane	N N N N N N N N N N N N N N N N N N N		Detection limit factor: Analysis date (As.Hy): Analysis date (Se):	1 11,26/86 12/01/86	12717786
1 Dichloroethane	222		Alkalinity Results (mg/l)	~	
2010) 2010) 1,1-Trichloroethane 1rbon tetrachloride	22.2		Bicarbonate Alk., as CaCO3 Carbonate Alk., as CaCO3 Hydroxide Alk., as CaCO3	350 38 80 80	340 ND ND
Omodichiorogenane  2 Dichloropropane ans-1,3 Ofchloropropene ichloroethene	2		Analysia date:	11/21/86	12/17/86
1,2 Trichloroethane	299	255	(1/bm) marnes 574	ć	ć
Chloroethylvinyl ether	99	29	Chloride Fluoride	7.0	**************************************
1,1,2,2 Tetrachloroethane b	QQ	0.1	Nitrate, bs N	5,8 ⊕ CIN	. 0
Chlorobenzene Dichlorobenzenes		<b>22</b>	Phosphate, as P Sulfate	007 200	MD 210
Detection limit factor: Surrogate Recovery, & Analysis Date:	1 74 11720786	1 99 127.227.21	Detection limit factor: Analysis date:	11/1//86	12-12-86
8020 Results (ug/1)			Total Cyanides (mg/l)	Î	NE
<i>Benzene</i> Chlorobenzene	Q Q	Q Q	Detection limit factor: Analysis date:	11/26/86	1 12:19:86
2 Dichlorobenzene 3 Dichlorobenzene	99	22	Total Dissolved Solids (mg/1)	730	2.10
Elwylbenzene Toluene Total Kylenes	EN 6	2995 2995	Detection limit factor: Analysis started:	11/17.86	38.27.21
Detection limit factor: Surrogate Recovery, %	~ •	<b>2</b> 66	Metal Results (1471)		
Analysis Date:	11 20786	12722/86	Bartum, Ba Cadatum, Cd Chromatum, Cr Lead, Pb Silver, Ay	190 MD 21 ND ND	220 NED 20 20 NED NED
			Detection limit factor: Analysis date (Ha); Analysis date (Others);	01/21/87	01/21/87 01/21/87
			Mineral Results (mg/l)		
			Colvina, Ca Iron, Fe Mattestian, My Manganas, Mi Fotastian, K Sodium, Ma	1 50 1 5.5 2 1.4 2.8 2.8	120 9.4 5.1 0.18
			Detection limit factor: Analysis date (169). Analysis date (8).	01-20 B2 01-19 B3	01 21/B 7

TABLE N-7. Groundwater sampling results for Well MAFB-10 at Mather AFB, California - WEST DITCH

	Round 1 11/14/86 771	Round 2 12/08/86 603		Round 1 11/14/86 771	Round 2 12/08/86 603
	1.1.4.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	and the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second s		9 4 4 1 1 1 0 9 0
Chloromethane	Q	CZ	Bicarbonate Alk., as CaCO3	73	92
Bronomethane	29	999	Hydroxide Alk., as CaCO3	QN	ON ND
Vinyl chloride	QN ND	QN ND	Analysis date:	11/21/86	12/09/86
Chloroethane Methylene chloride	ON C	QN CN			
Trichlorofluoromethane		<b>N N</b>	429 Results (mg/l)		
1,1-Dichloroethane	2	2	Bromide	0.2	6 0
trans-1,2-Dichloroethene	Q.	QN	Chloride	12	01
Unioroior 1 2-Dichloroethere	2 5		Fluoride	QN (	QN (
1, 1, 1-Trichloroethane		5 5	Nitiate, pu N	9.0 E	၁.၀ ဂ
Carbon tetrachloride	2	2	Phosphate, as P	Q Q	
Bromodichloromethane } 2-Dichloromene	Q C	ON C	Sulfate	3.9	ن ا
trans-1,3-Dichloropropene	2	<b>S S</b>	Detection limit factor:	1	
Trichloroethene Dibromochloromethane	Q Q N	QQ	Analysis date:	11/16/86	12/09/86
1,1,2-Trichloroethane cis-1,3-Dichloropropene	QN QN	ON ON	Total Dissolved Solids (mg	(89/1) 120	130
2-Chloroethylvinyl ether	QN	QN		ı	
Bromoform 1,1,2,2-Tetrachloroethane Tetrachloroethene Chlorobenzene	<u> </u>	ON ON S	Detection limit factor: Analysis started:	1 11/15/86	12/09/86
Dichlorobenzenes	Q.	Q N	Mineral Results (mg/l)		
Detection limit factor: Surrogate Recovery, %	104	106	Calcium, Ca Tron, Fe	15	7 4
	11/19/86	12/11/86	Magnesium, Mg Manganese, Mn	7.02 7.4 0.04	7.7
8020 Results (ug/l)			Potassium, K Sodium, Na	1.4 10	1.7
Benzene	QN N	QN	Detection limit factor:	1	
Chioropenzene 1,2-Dichlorobenzene	Q Q	Q Q	Analysis date (ICP): Analysis date (K):	01/20/87	01/20/87
1,3-Dichlorobenzene 1,4-Dichlorobenzene	O ON	ON ON			
Ethylbenzene					
Toluene Total Xylenes	N QN	ON ON			
	- 3	1			
surrogate Recovery, & Analysis Date:	104 11/19/86	106 12/11/86			

Groundwater sampling results for Well MAFB-11 at Mather AFB, California - WEST DITCH TABLE N-8.

s (ug/l)  romethane ND ride Omethane ND ND ND ND ND ND ND ND ND ND ND Octhane ND Octhane ND Octhane ND Octhane ND Octhane ND Octhane ND ND Octhane ND ND Octhane ND ND Octhane ND ND Octhane ND ND Octhane ND ND Octhane ND ND Octhane ND ND Octhane ND ND Octhane ND ND Octhane ND ND Octhane ND ND Octhane ND ND Octhane ND ND Octhane ND ND Octhane ND ND Octhane ND ND ND Octhane ND ND ND ND ND ND ND ND ND ND ND ND ND		768	604		11/13/86	12/08/86 604
### No.   No.   Bicarbonace Alk., as CaCO3   77   ### Carbonace Alk., as CaCO3   77   ### No.   No.   Analysis date:   11/21/06   12/09/ ### No.   No.   Analysis date:   11/21/06   12/09/ ### No.   No.   Analysis date:   11/21/06   12/09/ ### No.   No.   No.   Chloride   No.   O.5   ### No.   No.   Chloride   No.   No.   ### No.   No.   No.   Chloride   No.   ### No.   No.   No.   Chloride   No.   ### No.   No.   Chloride   No.   ### No.   No.   Chloride   No.   ### No.   No.   Chloride   No.   ### No.   No.   Chloride   No.   ### No.   No.   No.   Chloride   No.   ### No.   No.   No.   Chloride   No.   ### No.   No.   No.   Chloride   No.   ### No.   No.   No.   Chloride   No.   ### No.   No.   No.   Chloride   No.   ### No.   No.   No.   Chloride   No.   ### No.   No.   Chloride   No.   ### No.   No.   Chloride   No.   ### No.   No.   Chloride   No.   ### No.   No.   Chloride   No.   ### No.   No.   No.   Chloride   No.   ### No.   No.   No.   Chloride   No.   ### No.   No.   No.   Chloride   No.   ### No.   No.   No.   Chloride   No.   ### No.   No.   No.   Chloride   No.   ### No.   No.   No.   Chloride   No.   ### No.   No.   No.   Chloride   No.   ### No.   No.   No.   Chloride   No.   ### No.   No.   No.   Chloride   No.   ### No.   No.   No.   Chloride   No.   ### No.   No.   No.   Chloride   No.   ### No.   No.   No.   Chloride   No.   ### No.   No.   No.   Chloride   No.   ### No.   No.   No.   Chloride   No.   ### No.   No.   No.   Chloride   No.   ### No.   No.   No.   Chloride   No.   ### No.   No.   No.   Chloride   No.   ### No.   No.   No.   Chloride   No.   ### No.   No.   No.   Chloride   No.   ### No.   No.   No.   Chloride   No.   ### No.   No.   No.   Chloride   No.   ### No.   No.   No.   No.   No.   ### No.   No.   No.   No.   No.   No.   ### No.   No.   No.   No.   No.   No.   ### No.   No.   No.	0	11 14 15 16 18 19 11	, 0 0 11 12 13 14 14 16 16 16 16 16 16 16 16 16 16 16 16 16	11 10 10 16		
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Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate   Participate	romomethane	Q !	Q.	Carbonate Alk., as CaCO3	QN	QN
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No.   No.   No.   Chloride   No.	ans-1,2-Dichloroethene	S	QN QN	Bromide	QN	6.0
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Martee, as N	2-Dichloroethane	QN	Q!	Fluoride	CIN	GN
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opropene         ND         Detection limit factor:         11/14/86         12/09           ane         ND         Analysis date:         11/14/86         12/09           Ann         ND         Total Dissolved Solids (mg/l)         12/09           1 ether         ND         ND         Total Dissolved Solids (mg/l)         12/09           roethane         ND         ND         Detection limit factor:         11/14/86         12/09           roethane         ND         ND         Analysis started:         11/14/86         12/09           actor:         1         1         Analysis started:         11/14/86         12/09           nD         ND         Mn         Analysis started:         11/14/86         12/09           actor:         1         1         Analysis started:         11/14/86         12/09           nD         ND         Mn         Mn         Mn         Mn         11/14/86         12/09           nc         11/18/86         12/11/86         Hangmants Mn         Mn         Nn         Nn         Nn           nc         ND         ND         Analysis date (K):         11/2         Nn           nc         ND         Analysis date (ICP):	, 2-Dichloropropane	QN	ž D	n đ	2 2 3 4	UN 2
ND	ans-1,3-Dichloropropene	ON	QN			
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ropene ND ND Total Dissolved Suilds (mg/l) 120  roethane ND ND Detection list factor: 11/14/86 12/  ND ND ND Analysis atarted: 11/14/86 12/  ND ND HIPERAL Results (mg/l) 18  Y, * 11/18/86 12/11/86 IGO, Fe Hanganes, Hn 0.072  Hanganes, Hn 0.01  ND ND ND Detection limit factor: 10/19/87 01/19/87  ne ND ND ND Analysis date (K): 01/19/87 01/19/87  ND ND ND ND ND ND ND ND ND ND ND ND ND N	1,2-Trichloroethane	2 2		Alalysis date:	11/14/86	12/09/86
Total Dissolved Solids (mg/l)   120	s-1,3-Dichloropropene	2	QN			
ND	Chloroethylvinyl ether	<b>Q</b> !	QN	Solids		180
actor:    ND	Omoform 1 2 2-Tatrachlorosthans			Date of the state	•	•
ND	trick rectangly committees	2		Analysis started:	11/14/86	10/00/51
It factor:   1	lorobenzene	£	Q <b>N</b>			00/00/71
1	.chlorobenzenes	QN	QN			
112   103   Calcium, Ca   18	tection limit factor:	_	-	Mineral Results (mg/1)		
11/18/86	irrodate Recovery, %	112	103	Calcium. Ca	18	1.8
Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, Mg   Hagnesium, M	alysis Date:	11/18/86	12/11/86	Iron, Fe	0.072	660.0
1ts (ug/l)					8.8	4.6
115 (ug/l)   No				Manganese, Mn	0.1	0.091
enzene ND ND Detection limit factor: 10  enzene ND ND Analysis date (ICP): 01/20/87 01/20  enzene ND ND Analysis date (K): 01/19/87 01/19  enzene ND ND ND Analysis date (K): 01/19/87 01/19  It factor: 1 1 1 1 10/8  overy, % 11/2 10/8	8020 Results (ug/1)			Potassius, K	1.2	1.3
enzene ND ND Analysis date (ICP): 01/20/87  enzene ND ND Analysis date (ICP): 01/19/87  enzene ND ND Analysis date (K): 01/19/87  ND ND ND ND ND ND ND ND ND ND ND ND ND N	nzene	CIN		Souther, Na	0 -	=
enzene         ND         Analysis date (ICP):         01/20/87           enzene         ND         Analysis date (K):         01/19/87           enzene         ND         ND         Analysis date (K):         01/19/87           enzene         ND         ND         ND         01/19/87           ND         ND         ND         ND           It factor:         1         1         1           Lt factor:         1         1         1           Lt factor:         3         10/8         10/8	lorobenzene	) C	) E	Detection limit factor:	-	-
enzene         ND         Analysis date (K):         01/19/87           enzene         ND         ND         ND           ND         ND         ND         ND           It factor:         1         1         1           Lovery:         3         1         10/5	2-Dichlorobenzene	QN	QN	Analysis date (ICP):	01/20/87	01/20/87
ND	, 3 Dichlorobenzene	QN	GN	Analysis date (K):	01/19/87	01/19/87
It factor:  Overy, %  11.2	4 - Dichlorobenzene	2	E i			
It factor:  Overy, % 112 1	ny menzene Nuene	2 2				
1t factor: 1 overy, % 112	otal Xylenes	2 2	Î Î			
112		1	Ì			
112						
112	tection limit factor:	-	-			
		112	10.4			

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Footnd 1 11 · 17 / 86 795	Round 2 12709786 6.12		Hound 1 115-17-86 295	Round 2 12,097H6 612
*** ** ** ** ** ** ** ** ** ** ** ** **		Atomic Absorption Hetal Results (uqzl)	Results (ug/1)	
222	222	Arsenic, As Mercury, Hy Selenium, Se	<u> 222</u>	222
		Detection limit factor: Analysis date (As, 16): Analysis date (Se):	1 11/26/86 12/01/86	12717786 12717786
<b>2</b>	229	Alkalinity Results (ug.1)	•	
		Bicarbonate Alk., as (a(0) Carbonate Alk., as (a(0) Hydroxide Alk., as (a(0)	1. <del>5.</del> 5.	8.2 CIN ON
	<b>22</b>	Analysis date:	11721786	12716786
<b>2</b> 2 1	2 Q	429 Benults (mg/1)		
<b>2</b> 2 .	<b>2</b> 2	Browlde	QN	0
<u> </u>	<u> </u>	Chloride	6.7	~ ·
Î	<u> </u>	文 (1 0 1 0 1 1 2 1 2 2 2 2 2 2 2 2 2 2 2 2	£ 2	£ 9
î î	e e	Phosphate, as P	Q ~	<b>9</b> ₹
1 81 117.217.86	1 101 12711786	Detection limit factor: Analysis date:	11/18/86	12/10/86
		Total (yanides (mg/1)	Û	G.
ê ê	- <u>ê</u>	Detection limit factor: Analysis date:	11 26786	1 12719786
<u> </u>	2 E	Total Dissolved Sulids (mg/l)	120	21
<b>1</b>	ê <del>û</del> ê ê	Betection Half factor: Analysis started:	117.18786	1 12710786
- <del>-</del>	<del>-</del> <u>-</u> <u>-</u>	Metal Results cup/10		
* # T	1	Baritas, Ba Cadestum, Cd Chrossium, Cr Lead, Pb Silver, Aq	7 G N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N S C N	* <b>9</b> 2 <b>8</b> 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8
		Detection limit factors Analysis date (Ma): Analysis date (Others):	01/21/8/2 01/20/8/2	01/21:82 01/21:82 01/20/82
		Mineral Results (mg/l)		
		Internation	* # 0	# 4: 0 02
		Magnession, My Manualsers, Mn Folkstation, M Coffice, Na	7 (18 d) 7 d) 8 d) 9 d)	N Z T
		Destroy 1 top 1 1 m 1 for from Analyzata daste in 10 for		-

Detection limit factor: Surrogate Recovery, & Analysis Date:

8020 Results (ug/1)

Benzene (*hlorobenzene 1,2 Otthlorobenzene 1,3 Otthlorobenzene 1,4 Otthlorobenzene Ethylbenzene Tologen

Detection Hmit factor Surrogate Recovery, A

Antly 11 a lister

Chloromethane
Dichoromitane
Dichoromitane
Winyl chloride
Methylene chloride
Hethylene chloride
I Tichlorof loor omethane
I Dichloroethane
Chloroethane
Chloroethane
I J J Chloroethane
I J J Chloroethane
I J Dichloroethane
Chloroethane
I J J Tetraihloroethane
Chloroethylvinyl ether
Bromodoum
I J J Z Tetraihloroethane
Chloroethylvinyl ether
Chlorobenzene
Dichloroethene

601 Results (ug/1)

Groundwater sampling results for Well MAFB-41 at Mather AFB, California - 7100 DISPOSAL ARFA TABLE IV-12.

Record 2 17 13 (8) 4 (4)	•	ÎN ÎN	1 00 12/17/86 12/17/86		85 MD MI	12/17/86		~ ⊕ ~	~992	12712786	Û	12719786	1 70	12712:88		9 Q 07	Û	01/21/87		20 0.2 0.2 0.2 0.4 0.4 1.1	
Round   1   11   18   86   29   48   29   48   49   48   49   48   49   48   49   49	* * * * * * * * * * * * * * * * * * * *	222	1.00 11/16/86 12/01/86		150 ME)	11/21/86		0 5 g g g g g g g g g g g g g g g g g g		11/21/86	Œ	11/26/86	¥ b 097	11721786		£ <b>6</b>	<u>e</u> e	01/21/87 01/20/87		2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	
Round   11   18   86   29   86   29   8   29   29   29   29   29   29	Results (ug. 1)	Î	1.00 11.16/86 11 12/01/86 12	-	150 MB CB	11/21/86 11		### 9`0 0'0 0'0 0'0 0'0 0'0 0'0 0'0 0'0 0'0 0	** **** ******************************	11.21.86 11	Û	11/26/86 11	1) 260 q #	11.21.86 11.		110 MD 21	G G	01/21/87 01 01/20/87 01		2277	To . 8 61 .0
	Atomic Absorption Metal Results (ug.1)	Arsente As Mercury, Ng Selentus, Se	Detection limit factor: Analysis date (Se): Analysis date (Se):	Alkalinity Results (my/l)	Bicarbonate Alk., as (a(0)) Carbonate Alk., as (a(0)) Mydroxide Alk., as (a(0))	Analysis date:	429 Results (uq/l)	Browide Chloride Fluoride	Mitrate, so M Mitrite, so M Phosphate, so P Gulfate	Detection Halt factor: Analysis date:	Total Cyanides (mg/1)	Detection limit factor: Analysis date:	Total Dissolved Solids (aq/1)	Detection limit factor: Analysis started:	Metal Results (ug/1)	Derium, Ba Cadmium, Cd Chromium, Cr	Lead, Pb 31 lver, Aq	Detection limit factor: Analysis date (Ba): Analysis date (Others):	Mineral Results (mg.1)	Calcium, Ca Iron, Fe Magnesium, Mg Mangarese, Mn Evianskium, K Soutium, Na	Detection Digit factor Analysis date (F)
Hound 2 125-13 - Hb. 6-14				291	1999	292	P.O.S.	1999	Ç 4 Q Q	1 99 12/22:86		Q Q	229		?	99 33 37 B		eded			
Heromed   1   11   18   186   1879   18   18   18   18   18   18   18   1		£££;	<b>,</b> 2222		8 <del>8 8 9</del> 9	2797	799	1999	2 <u>2</u> 80 8 8 9	1 102 11/24/86		99	0.2		- 00	11:24:86		id, holding time exceeded	)		
Record 1 11 18 86. 298	**	999	, <u>2999</u>	2 2 2	1,555	<u> </u>	77 2	1999	2	1 110 11/24/86		22	<u></u> [8]	<u> </u>				d, holding			

* Data invalid, hold

Detertion limit factor: Surrogate Recovery, & Analysis Date:

8020 Results (ug/1)

Benzene Chlorobenzene 1.2 Dichlorobenzene 1.3 Otchlorobenzene Ethylbenzene Toloene

Detection limit factor: Surrogate Recovery, A. Analysis Date.

Chloromethane
Biromethane
Dichlorodif luoromethane
Chlorodif luoromethane
Chlorodif luoromethane
Chlorodif luoromethane
Lichlorod luoromethane
Li Dichloroethane
Chlorofora
Li Dichloroethane
Chlorofora
Li Dichloroethane
Chlorofora
Li Dichloroethane
Chlorofora
Li Dichloroethane
Chlorodia
Li Dichloroethane
Carbon tetrachloride
Li Dichloroethane
Carbon tetrachloride
Carbon tetrachloride
Carbon tetrachloride
Carbon tetrachloride
Carbon tetrachloride
Carbon tetrachloride
Carbon tetrachloride
Carbon tetrachloride
Carbon tetrachloride
Carbon tetrachloride
Carbon tetrachloride
Carbon tetrachloride
Carbon tetrachloride
Carbon tetrachloride
Chloroethylvinyl ether
Chloroethylvinyl ether
Chlorobenzene
Dichlorobenzene

601 Results (uq.1)

Groundwater sampling results for Well MAFB-42 at Mather AFB, California - 7100 DISPOSAL AREA N-11. TABLE

100   11   11   11   11   11   11   1		Renard 1 11 18786	Round 2 12/11/86		Round 1 11/18/86	Round 2 12-11/86	
Atomic Aborgition Metal Results (144-1)  11.4		<b>4</b>	79.0		<b>3</b>	632	
Miles	601 Results (ug/1)			Atomic Absorption Metal	Results (ug. 1)		
10	Chloromethane Bromomethane	Ŷ	9	Arsenic, As	Ĉ	Q	
1	or odif luor one thane	<b>2</b> 2 3	22	Mercury, Mg Selenium, Se	<u> </u>	i i	
1.4	chioride	22	2 2	Detection limit factors	-	_	
Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Miles   Mile	lene chloride lorofluoromethem	• · · ·	2	Analysis date (As.Hg):	11/26/86	12/11/86	
Mail	chloroethene			COC DESCRIPTION	98/10/71	17/1/1/86	
Mail	Chloroethane 1,2 Dichloroethene	<u> </u>		Aikalinity Results (mg/)			
Mail		ê	2				
NO	Trichloroethane			Dicarbonate Alk., as CaCO) Carbonate Alk., as CaCO3	÷ <b>=</b>	017 M	
11/21/86   11/21/86   11/21/86   11/21/86   12/17/86   11/21/86   12/17/86   11/21/86   12/17/86   11/21/86   12/17/86   11/21/86   12/17/86   11/21/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86	tetrachloride	2		Hydroxide Alk., as Ca(0)	Ę		
10	ichloropethane chloropropane	2 2	<u>9</u>	Analysis date:	48/16/11	70,51,51	
10	1, 3 Dichloropropene	€:	9		98 / 17 / 11	98//1/71	
NO	lor oethene loch bronethane	≃ ⊊	0./1	1 1 2 2 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			
Main	Trichluroethane	P	2				
Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marce   Marc	3 Dichloropropens	2 5	2 9	Broatde	F . 7	0.7	
NO	or a	1 9	2 2	Fluoride	<b>*</b> ~ °	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	
10	2 Tetrachloroethane	ű,	9	Mitrate, as N	0.7	0.0	
1	horoethene	e i	2.7	Withite, as w	2	ULD	
1	Of chiorobehrenes	Îŝ		Phosphale, as P Suifate	Q 00 1	G 0'.	
11/21/86   12/22/86   Analysis date:   11/19/86   12/12/86   12/12/86   12/22/86   12/12/86   12/19/86   12/19/86   12/19/86   12/19/86   12/19/86   12/19/86   12/19/86   12/19/86   12/19/86   12/19/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/87   12/12/86   12/12/86   12/12/86   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/12/87   12/	Jon Mait factor:	-		Detection Mant factors	-	· -	
Total Cyanidas (mg/1)	inte Recovery, % is Date:	75 11 - 21 - 86	94	Analysis date:	11/19/86	12/12/86	
NEW   NEW   Malysis date:   11/26/86   12/19/19/19/19/19/19/19/19/19/19/19/19/19/				Total Cyanides (mg/1)	Q.	QM	
Main	(I/fm) sames or			Dataction Hair Cachor.	_	•	
ND	e benzen	ON ON	29	Analysis date:	11/26/86	98/61/71	
Main	chlorobenzene	99					
ND   ND   Detection limit factor:   1	chlorobenzene	2 2		Total Dissolved Solids (mg/		350	
Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Mail	Enzene		<b>9</b> i	Detection limit factor:		-	
1	Xylenes		22		11/14/86	12/12/86	
Bartum, Ba	ion limit factor.	- 5	- ;	Metal Results (uq/l)			
11/21/86   12/22/86   Chromium, Cd   MD   MD	are mercovery.	٤	<del>,</del>	Berice. Be	130		
	: :		:	Cadmium, Cd	9	7 <b>2</b>	
ND   ND   ND   ND   ND   ND   ND   ND	13 178 C C	11/21/86	14:22:86	Chromium, Cr Lead, Pb	22 NT	67	
				Silver, Ag	Q.		
				Detection limit factor:	-	-	
## 0.26				Analysis date (Ba): Analysis date (Others):	01/21/87 01/20/87	01/21/87	
0.15 (mg/1) 0.26 0.26 0.61 0.61 1.70 0.70 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61							
44 0.76 2.5 0.61 1.60 1.10 1.10 1.10 1.10 1.10 1.10				Mineral Results (mg/1)			
1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1				Calcium, Ca	<b>\$</b>	<b>:</b>	
(4) (4) (4) (4) (4) (4) (4) (4) (4) (4)				Magnestum, Mg Manganese, Mn	2 5 7 1 4 7 1 4 7	<u>- 24</u>	
01720187				Fotassium, K Sodium, Na	T.g		
017.0.87 01.14.8				Detection limit factors	~	~	
				Analysis date (1975). Analysis date (185	01770187	01-21-87 of 19-87	

Groundwater sampling results for Well MAFB-43 at Mather AFB, California 7100 DISPOSAL AREA N-12.TABLE

Round 2 17-11-86 6.18	•	222	15/17:186 18/17:186 1		# 1 # # # # # # # # # # # # # # # # # #	12/17/86		).4 ).4	7 <b>Q</b> Q	<b>14</b> 0 ~ ~	1 2/12/86	ĝ	12/18/86	Ç	12/19/86	ê	12/16/96	₽.	12/12/86		0년 일 2 일 2 일 2 일 2 일 2 일 2 일 2 일 2 일 2 일 2	1 01721787 01721787		-18-27-2 -20-27-2	- G :
Monard 1 115.17786 190 190 191 Frater	::	<b>99</b> ê	1 11/26/86 12/01/86		3 <b>e 2</b>	11/21/86		<del>-</del>	~ <b>+</b> &	₩ 5.5	11/18/86	£	11/21/86	9	11/26/86	900 0	98/52/11	001	1 11/18/86		6 G 2 G G	01:21/8) 01:20:87		2	10 55 10 10 10 10 10 10 10 10 10 10 10 10 10
# 1 0 0 0 PM	sults ing/1)	888	11,26,86 12,01,86		9 <b>* Q</b>	11,21,86		- 6	0 7 1 3 0 4	₩ 7	11/18/86	Ē	11/21/86	QI.	11/26/86	♦70 O	117.257.86		11/18/86		8 E E E E	01/21/87 01/20/87		5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1 : 1 : 1 : 1 : 1 : 1 : 1 : 1 : 1 : 1 :
	Atomic Absorption Metal Results 18471)	Arsenic, As Mercury, Hg Selenius, Se	Detection limit factor: Analysis date (As.Ng): Analysis date (Se):	Alkalinity Results (ug/1)	Bicarbonate Alk., as (a()) Carbonate Alk., as (a()) Hydroxide Alk., as (a())	Analysis date:	429 Results (mg/1)	Browlde Chloride	Fluoride Mitrate, as M Mitrite, as M	Phosphate, as P Sulfate	Detection limit factor: Analysis date:	Petroleum Mydrocarbons (mg/l)	Detection limit factors Analysis dates	Total (yanides (mg/1)	Detection limit factor: Analysis date:	Total Phenols (mg/l)	Detection Halt factor Analysis date:	Total Dissolved Sulids (ag/1)	Detection limit factor: Analysis started:	Metal Results 1.19 1.1	Bertom, Re Cadmiss, cd Chromiss, cr Lead, Ph Silver, Aq	Detection limit factor: Analysis date (Na) Analysis date (Others)	Miceral Benuits (mg 1)	California da Front, Re Montrestone, Re Montrestone, Re Montrestone, Re Scottone, Ma	Defection limit to the Amalysis Steel Steel Steel
7. Benear 5. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.	:	în û	2222	29	222 2	<b>e e</b> e	221	200	999	<b>2 2</b>	1 95 12/16/8 <b>6</b>		êê	886	999	-	48 170 160 86								
		£ £ £	55.55	122	222E	226	221	222	<b>22</b> 2	<b>e</b> e	1 77 11/21/86		2 2	266	<b>12</b> 26	-	11 21 86								
4 1 1 1 K	:	929	ê <b>ê 9 9</b> 9		<u>eee</u>	<u>e e e</u>	299	999	<b>eee</b> !	<b>2 2</b>	1 85 11/20/86		€ €	999	<b>2</b> 50 0	-	85 11 - 20 - 86								
	601 Results (1471)	Chloromethane Brosomethane Dichlorodifluoromethane	virigi (Alouedame Chloroethame Methylene chloride Trichlorofluoroethame	trans 1,2 Dichloroethane	Note of the state  Bromodichloromethane 1,2 Dichloropropane trana 1,3 Dichloropropene	Tr Ichloroethene Dibrosochlorosethane	Chloroethylvinyl ether	Bromoform 1.1.2.2 Tetrachloroethane Tetrachloroethene	(bloro <b>benzene</b> Dichloro <b>benzenea</b>	Detection limit factor: Surrogate Recovery, N Analysis Date:		Benzene (**)	1, 2 Otchlorobenzene 1, 3 Otchlorobenzene 3, 4 Otchlorobenzene	Ethylbensene Tolloene Total Mylenes	Detection Halt factor:	Surrogate Recovery & Analysis late:									

Groundwater sampling results for Well MAFB-44 at Mather AFB, California - 7100 DISPOSAL AREA N-13. TABLE

	Round 1 11/17/86 793	Round 2 12/12/86 639		Round 1 11/17/86 793	Round 2 12/12/86 639	
601 Results (ug/1)		4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	Atomic Absorption Metal Results (uq/1)	Assults (uq/1)	10 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	:
Chloromethane	QN	ÛN	Armenic, As	· 9	QN	
Bromomethane Dichlorodifluoromethane	<b>9 9</b> (	99	Mercury, Mg Selentum, Se	<u>e</u> e		
Vinyi chioride Chloroethane	2 9	29	Detection limit factor:	-	-	
Methylene chloride Trichlorofluoromethane	<b>2</b> 2	22	Analysis date (As, ikr): Analysis date (Se):	11/26/H6 12/01/B6	12/17/86	
1,1 Dichloroethene	2 2	9				
trans 1, 2 Dichloroethene	2	2	Alkalinity Results (mg/l)	_		
Uniororor I.2 Dichloroethane	2		Bicarbonate Alk., as CaCO3	310	380	
1,1,1 Trichloroethane Carbon tetrachloride	2 2	2 2	Carbonate Alk., as CaCO3 Hedrowide Alk. as CaCO3	<u> </u>	2 5	
Bromod ichloromethane	Q	<b>Q</b>	25	•		
1,2 Dichloropropane trans 1,3 Dichloropropene	2	29	Analysis date:	11/21/86	17/1//86	
Trichloroethene Dibromochloromethane		<b>9 9</b>	429 Results (mg/1)			
1, 1, 2 Trichloroethane	2 9	⊋ ⊊			ć	
Chloroethylvinyl ether		2 2	brogiae Chloride	29	2.0	
Bromoform	€ (	€ (	Fluoride	Q (	0.2	
1,1,2,2 letrachloroethane Tetrachloroethone	2 2		Nitrite, as N	2 G	2 €	
Chlorobenzene	2	99	Phosphate, as P	8	2	
Dichlorobenzenes				2	7.0	
Detection limit factor: Surrogate Recovery, % Analysis Date:	1 66 11/21/86	1 110 12/18/86	Detection limit factor: Analysis date:	11/18/86	12/14/86	
d occo			Total Cyanides (mg/l)	Đ	Q	
GOZO REGULES (US/1)			Detection limit factor:	-	_	
Benzene Chlorobenzene	Q QN	CIN	Analysis date:	11/26/86	12/19/86	
1.2 Dichlorobenzene	2	2	Total Dissolved Solids 1997	420	O de 2	
1,4 Dichlorobenzene	Q	2			2	
Ethylbenzene Toluene	G CN	ON CON	Detection limit factor: Analysis started:	1 11/18/86	12/14/86	
Total Kylenes		Q <b>X</b>				
Detection limit factor: Surrogate Recovery, %	1 94	1 96	Metal Results (ug/1)			
			Berjus, Be	140	200	
Analysis Date:	117.217.86	12718786	Cadmium, Cd Chromium, Co	Q 5	윤	
			Lead, Pb Galver As	2	299	
			Fr. 1301	2	2	
			Analysis date (Ba): Analysis date (Ba):	01/21/87	01/21/07	
					(8,17,10	
			Mineral Results (mg/l)			
			Calcium, Ca	7.4	89	
			iros, Fe Macocalus, Ma	1.7	=======================================	
			Manganese, Mn Potassium, K	0.26	0.21	
				•,	67	
			Detection limit factor: Analysis date (ICP): Analogic date (K.	01/20/87	01/21/67	
			The same of the same		70741710	

Groundwater sampling results for Well MAFB-45 at Mather AFB, California - 7100 DISPOSAL AREA N-14. TABLE

	Hound 1 11/15/86 784	H 12 12 640 dup			Round 1 11/15/86 784	**************************************	Round 2 12/12/86 640 641 dup11cated
601 Results (ug/1)				Atomic Absorption Metal Results (ug/1)	Results (ug/1)		
Chloromethane Bromomethane Dichlorodif luoromethane	<b>222</b>		999	Arsento, As Mercury, Hg Selentum, Se	Î Q Î	2 N N	Q C Q
Vinyl chiotide Chloroethane Methylene chloride Trichlorofluoroæthane	8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	<b>2999</b>	<u> </u>	Detection limit (actor: Analysis date (As.Hq): Analysis date (Se):	11/26/86 12/01/86	1 12/17/86 12/17/86	1 12/17/86 12/17/86
1.1 Dichloroethane trans 1.2 Dichloroethene	<b>9 2 1</b>	99	221	Alkalinity Results (aq/l)			
( nicolors 1,2 Dichloroethane 1,1,1 Trichloroethane Carbon tetrachloride			2222	Blearbonate Alk., as (at'0) Carbonate Alk., as (at'0) Hydroxide Alk., as (at'0)	240 ND ND	220 ND ND	NEO UEO NEO NEO NEO NEO NEO NEO NEO NEO NEO N
Browd ichioromethane 12 Dichloropropane 1 trans 1,3 Dichloropropene Trichloroethene	2 2 2 <u>2</u>	2222	<b>222</b>	Analysis date:	11721786	12/17/86	12/17/86
Dibromochloromethane 1, 1, 2 Trichloroethane	22	99	22	429 Results (mg/l)			
cis 1,3 Dichloropropene Chloroe /lvinyl ether Bromoform	222 2	222	222	Browlde Chloride Fluoride	0.2 22 0.2	0.2 22 0.2	
1,1,2,2 Tetrachloroethane Tetrachloroethene Chlorobenzene Dichlorobenzenes	Q Q Q Q	SCSS		Nitrate, as N Nitrite, as N Phosphate, as F Guifate	<b>非</b> 章 GN E ⁺ 0 B ⁺ 3	ON ON ON ON ON S. S.	0.8 ND ND ND ND ND
Detection limit factor: Surrogate Recovery, & Analysis Date:	1 85 11720786	1 72 12/18/86	1 6.7 12/18/86	Detection limit factor: Analysis date:	11718786	12/14/86	12/14/86
9000 Beautiful (1/22/1)				Total Cyanides (mq/l)	0 05	CIN	Ü
Benzene	Ş	Û,	Ê	Detection limit factor: Analysis date:	117.26786	12/19/86	12 19786
1,2 Dichlorobenzene 1,3 Dichlorobenzene		221	<b>2 2 2</b> 1	Total Dissolved Solids (mg/1)		100	280
1,4 Dichlorobenzene Ethylbenzene Total Xylenes	ÎŜŜŜ		2	Detection limit factor: Analysis started:	11 - 1 - 7 - 86	12/14/86	12:14:86
Detection limit factor: Surrogate Recovery, %	1 <del>8</del>	- 6-2	- 2/	Metal Results (uq/1)			
Analysis Date:	11+20+86	12/18/86	12718786	Bartus, Ba Cadmius, Cd Chromius, Cr Leed, Ub Silver, Ag	500 20 20 20 UN UN	220 ND 16 16 ND ND	O O N T N N
				Detection limit factor. Analysis date (Bs). Analysis date (Others):	1 01/21/87 01/20/87	1 01/21/87 01/21/87	01/21/87
* Data for nitrate/ni	nitrite invalid,			Mineral Results (84/1)			
holding time exceeded	ded			Calcium, Ca Iron, Fe Hagnesium, My Manganese, Mn Polassium, K Sudium, Ma	\$ 1 0 2 1 5 1 5 1 5 1 5 1 5 1 5 1 5 1 5 1 5 1	0.18 0.18 2.093 1.7.1	0 17 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
				Detection iimit factor Analysis date (F). Analysis date (F)	01 2005.70 10 19 H2	01.23 PB 7 19 PF 10	01-1-18/ 1-18/-18/

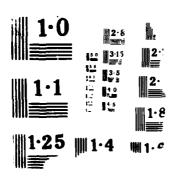
Groundwater sampling results for Well MAFB-46 at Mather AFB, California - 7100 DISPOSAL AREA TABLE N-15.

### ### ##############################		Hound 1 11746 - Rh 285	å y		171	Round 2 12/09/86 610
10	Results (ug/1)				raults (uq/1)	
Main	ethane thane	Û	ON M	Arsenic, As Mercury, Hg	22	Î
10	odifiuoromethane bloride	î î	<u> </u>	gelenium, de		Û <b>X</b>
Main	ithane ine chloride post por omet bane	€.7 €.7 €	222	Detection 1985 factor: Analysis date (As.Hq): Analysis date (Se):	11/26/86	12/17/86
Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Minimizer   Mini	hlor oethene	29	<b>2 2</b>			
High	. 2 Dichloroethene	2 2	22	Albaitnity Results (mg/i)		
Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary   Mary	hlorvethane i ichlorvethane	99	22	Stratbonate Alk., as CaCO3 Carbonate Alk., as CaCO3	<u>e</u> 2	0.7 L
Miles	tetrachloride chloromethane	₽ €	C) SR	Hydroxide Alk., as CaCol	Q	<b>E</b>
### ### ### ### ### ### ### ### ### ##	hloropropene 1, 3 Dichloropropene	<b>2</b> 2	221	Analysis date:	11721786	12/16/86
	or oethene och i or omethane	<b>22</b>	e e i	429 Rebuilts (mq/l)		
1	r ich loroethane 3 Dich loropropene		Q Q	Bronide	0.2	0.2
Mitthere = 3   Mitthere   Mitth	ethylvinyl ether	<u> </u>	€ €	Fluoride	0.1	Î
1	7 Tetrachioroethane	9 9		Withouth and W	2.6 #0	3, 2
1	alotoethene benzene robenzenes	99	<u>G</u>	Phosphate, as P	<u>1</u> 6 2	9,6
17/20/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   12/186   1	ion limit factor: ate Recovery, %	7 6	1 21	Detection limit factor: Analysis date:	1 11/17/86	12/10/86
13   0.9   MD   Detection (fast factor;   1   1726/86   12/19   MD   MD   MD   MD   MD   MD   MD   M	la l'ate:	11/20/86	17/11/86			
Detection issist factor:	4 / box 4 4 / 1 = 0 0			Total Cyanides (mg/1)	ON.	Û
Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min   Min	o keaning and a	o : 0	Q	Detection issic factor: Analysis date:	11,26,86	12/19/86
Mi)   MiD   Total Dissolved Solids (mq/1)   230	benzene Sekorobenzene	Q Q	22			
Miles	chlorobenzene	2	<b>Q Q</b>	Total Dissolved Solids (mg/)		260
### 120   1	chios obeniene	È E	999	Detection limit factor: Applicate plantage	11/17/186	12/10/86
1   1   1   1   1   1   1   1   1   1	Xylenes	0	2			<u>;</u>
Design	fon Half for lore	- 8		Metal Regulls (ugil)		
137,00786   1231-186   Cadallas, Cd   13   13   13   15   15   15   15   15	Are Herrovery, T	<b>:</b>	121	Bartus, Ba	1 20	100
		117.207.86	17:11:86	Cadmium, Cd Chromium, Cr	<b>8</b> 2	
(there): 01/21/87 01/22/10 1/20/87 01/22/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/20/87 01/2				Lead, Fb Silver, Aq	e e	4 E E
(1) (1) (1) (1) (1) (1) (1) (1) (1) (1)				Detection state factor: Analysis date (86):	1 17/10	1
0 000 000 000 000 000 000 000 000 000				Analysis data (Others);	01/50/87	01.20787
0 00 15 0 18 1 2 2 1 5 1 5 1 6 6 7 6 8 1 6 1 6 1 6 1 6 1 6 1 6 1 6 1 6 1 6				Money Beauty (mg/l)		
0.08 0.18 0.18 1.7 1.5 1.5 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.6				Calchan, Ca	=	**
17.7 10. 10. 10. 10. 10. 10. 10. 10. 10. 10.				Macrostus, My Macrostus, My Macroson, Mo	<b>6</b>	7.0 ¢ 1.6 2.0 £
10 24 05 10 10 14 14 10				Foregalue, X Sattue, No	<u>_</u>	<u>~</u> €
				Refer there 1880 factors Analysis date (195) Analysis date of	7 H 10 C 10	2, 40 2, 40 1, 44 1, 44

N-16. Groundwater sampling results for Well MAFB-47 at Mather AFB, California - WEST DITCH TABLE

Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and part   Disconsistant and p		11/14/86	600 4	2/09/86 7 608 uplicate		Round 1 11/14/86 773	Ко 127 607 dup	Round 2 12/09/86 607 608 duplicate
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N	Chloromethane	QN	CIN	î <b>N</b>	Birarbonate alv as Cacos	07.1	00	021
NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW	Bromomethane	i R	2	<u> </u>	Carbonate Alk. as CaCOS	97		
ND   ND   ND   ND   ND   ND   ND   ND	Olehlerodif luoromethane	QN	9	. E	Hydroxide Alk as Caco	) N	C N	
No. 1, 10	linyl chloride	Q	Q	S				
No. 7 a   No. 10 a	hloroethane	QN	Q.	Q.	Analysis date:	11/21/86	12/16/86	12/16/88
NO	lethylene chloride		QN	1.1 a				
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	A lorobenzene	] Z	` <b>S</b>	0 5	Mialysis started:	11/13/86	17/10/86	17/10/86
	1chlor obenzenes	Ź	2 2	2				
1					Mineral Results (mg/l)			
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	Recovery,	æ:		611	Calcium, Ca	25	<u>.</u>	),7
Hagnesium, Mg	nalysis Date.	38.81.11		2711/86	Iron, Fe	0.089	0.14	0.1.
Hanganese, Mn					Magnesium, Mg	13	11	-
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Ni   Ni   Ni   Ni   Ni   Ni   Ni   Ni	+11261.6	Ž	Ñ	. 104	Sodium, na	C T	71	-
Ni   Ni   Ni   Analysis date (R): 01/20/87 01/20/87   Prizence   Ni   Ni   Ni   Analysis date (R): 01/19/87 01/19/87   Prizence   Ni   Ni   Ni   Ni   Ni   Ni   Ni   N	hlorobenzene	Ž	Ž	Ž	Date of Con I (a) the factor.	~	-	
FIZETINE NI ANALYSIS GATE (K): 01/19/87 01/19/87 1/19/87 1/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 01/19/87 0	2 Dichlorobenzene	Ž	: X	. I	Analysis date (100).	01/20/87	1 01/00/187	8/00/10
N	, 3 Dichlor obenzene	Ž	· <del>Z</del>	ž	Analysis date (K):	01/18/87	01/10/6/	3/61/10
NIC TATAL STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE STATE ST	4 Dichlorobenzene	ž	Z	Ž		)		
NI NI NI NI NI NI NI NI NI NI NI NI NI N	thylbenzene	Z	Ξ	Ž				
NI MI MI MI MI MI MI MI MI MI MI MI MI MI	oluene	ž	R	î.				
Heterition limit is the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second	otal Xylenes	ž	17	ź				
The second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second secon	8							
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Groundwater sampling results for Well MAFB-48 at Mather AFB, California - WEST DITCH N-17. TABLE

	11/13/86 767	Round 2 12/08/86 601		Round 1 11/13/86 767	Round 2 12/08/86 601
601 Results (ug/1)	· C · · · · · · · · · · · · · · · · · ·	4 4 6 6 6 7 7 4 1 4 4 5 4 4 7 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	Alkalinity Results (mg/l)	6 6 10 10 10 10 14 14 14 14	67 67 10 10 10 15 66 64 44 20 13 14 26 15
Chloromethane	29	2	Bicarbonate Alk., as CaCO3	26	51
Dichloredifluoromethane	29	28	Carbonate Alk., as CaCO3 Hydroxide Alk., as CaCO3	QQ	Q QN
Chloroethane Methylane chloride	Q N C	223	Analysis date:	11/21/86	12/09/86
Trichlord lucromethane  1, 1-Dichloroethene	999	229	429 Results (mg/l)		
trans-1,2-Dichloroethene	22		Bromide	QN	QN
Chloroform 1 2-Dichlorosthans	29		Chloride	9 6	9.0
1,1,1-Trichloroethane	2 2	2 2	8	2.6	2.9
Carbon tetrachloride	2	2	z	Q	QN
bromogicalorometane 1,2-Dichloropropene		Q Q	Phosphate, as P Sulfate	ND 6.7	ON C
trans-1,3-Dichloropropane Trichloroethene	2 5	2 5	Date of the Canada	_	-
Dibromochloromethane 1,1,2-Trichloroethane cis-1,3-Dichloroethane	999	222		11/14/86	12/09/86
Chloroethylvinyl ether	25	2	Total Dissolved Solids (mc	(mg/l) 140	160
1,1,2,2-Tetrachloroethane Tetrachloroethene Chlorobenzene	2222	1222£	Detection limit factor: Analysis started:	1 11/14/86	12/10/86
	} -	•	Mineral Results (mg/l)		
Surrogate Recovery, *	74	105	Calcium, Ca	8.9	8.9
Analysis Date:	11/18/86	12/11/86		0.28	0.024
8020 Results (ug/l)			Magnesium, Mg Manganese, Mn Potassium, K	5.3 0.12 1.6	5.3 0.12 1.7
Benzene	QN	Q	an 'marage	0	<b>*</b>
Chlorobenzene 1,2-Dichlorobenzene	999	225	Detection limit factor: Analysis date (ICP):	01/20/87	01/20/87
1,4 Dichlorobenzene Ethylbenzene Toluene Total Xylenes	2999				10/61/10
Detection limit factor: Surrogate Recovery, %	7.4	1 105			
Analysis Date:	11/18/86	12/11/86			

Groundwater sampling results for Well MAFB-49 at Mather AFB, California - WEST DITCH TABLE N-18.

	Round 1 11/15/86 783	Round 2 12/12/86 642		Round 1 11/15/86 783	Round 2 12/12/86 642
601 Results (ug/l)		0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Alkalinity Results (mg/l)	**************************************	11 16 16 17 18 18 18 18 18 18 18 18 18 18 18 18 18
Chloromethane Bromomethane	O S	ON ON	Bicarbonate Alk., as CaCO3 Carbonate Alk., as CaCO3	45 18	39
Dichlorodifluoromethane	2	<b>8</b>	Hydroxide Alk., as CaC03		ND
Chloroethane Methylene chloride	ND 15.0 a	Q Q Q	Analysis date:	11/21/86	12/17/86
Trichlorofluoromethane 1,1-Dichloroethene	999	O O S	429 Results (mg/l)		
1,1-Dichiorocthene trans-1,2-Dichlorocthene	20	QN QN	Broatde	QN	0.4
Chloroform 1.2-Dichloroethane	<u> </u>	22	Chloride Fluoride	3.3	3.2
1,1,1-Trichloroethane	2	2		6.0	0.7
Carbon retrachloride Bromodichloromethane	2 5	₹ €	Nicrice, as w Phosphate, as P	ON IN	G (8
1,2-Dichloropropane	2	129		3.7	2.9
Trichlorethene	229	229	Detection limit factor:		-
Dibromocnioromethane 1,1,2-Trichloroethane	<b>2</b> 2!	22	Analysis date:	11/1//86	12/14/86
cis-l,3-Dichloropropene Chloroethylvinyl ether	221		Total Dissolved Solids (mg	(mg/1) 86	84
1,1,2,2-Tetrachloroethane Tetrachloroethene	2 <b>2</b> 2!		Detection limit factor: Analysis started:	1 11/17/86	12/14/86
Chlorobenzene Dichlorobenzenes	<b>2 2</b>				
, a	-	_	Mineral Results (mg/l)		
Surrogate Recovery #	<b>R</b> 2	4 6 6	Calcium, Ca	9.6	σ
	11/19/86	12/18/86		0.035	0.92
8020 Desilts (1.44/1)			Magnesius, Mg Mangaphan, Mg	1.5	3.5
(T/An) Elles 0700				3.5	2.9
Benzene	<b>8 8</b>	2 2	Sodium, Na	15	10
1,2-Dichlorobenzene 1,3-Dichlorobenzene 1,4-Dichlorobenzene		<u> </u>	Detection limit factor: Analysis date (ICP): Analysis date (K):	1 01/20/87 01/19/87	1 01/21/87 01/19/87
Ethylbenzene Toluene Total Xylenes	N N O O	ND ON ON ON			
Detection limit factor: Surrogate Recovery, * Analysis Date:	1 82 11/19/86	1 61 12/18/86			

Groundwater sampling results for Well MAFB-50 at Mather AFB, California - ACW DISPOSAL SITE N-19. TABLE

	Round 1 11/12/86 763	<b>3</b>			Round 11/12 76	9	nd 3/86 ica
601 Results (ug/l)	11 11 11 11 11 11 11 11 11 11 11 11 11	이 안 경 에 게 다 다 다 다 다 나 나 나 나 나 나 나 나 나 나 나 나 나 나	10 10 13 14 10 10 10 11 11 11	Alkalinity Results (mg/1)		0 d d o o o o o o o o o o o o o o o o o	9 0 0 0 0 0 0 0 0 0 0
Chloromethane Bromomethane Dichlorodifluoromethane	999	O N N N	ON NO ON	Bicarbonate Alk., as CaC03 Carbonate Alk., as CaC03 Hydroxide Alk., as CaC03	49 ND ND	49 ND ND	47 ND ND
Vinyl chloride Chloroethane Methylene chloride	ND ND 0.7 a		ND ND a 1.2 a	Analysis date:	11/21/86	12/17/86	12/17/86
Trichlorofluoromethane 1,1-Dichloroethene	9 Q Q	S N N	<b>S</b> S S	429 Results (mg/l)			
trans-1,2-Dichloroethene	Q Q		<u> </u>	Bromide Chloride	0.1 3.6	ND 3.2	
1, 2-Dichloroethane 1, 1, 1-Trichloroethane	Q Q I		Q Q		2.9	3.2	
Carbon tetrachloride Bromodichloromethane 1,2-Dichloropropane				Nitrite, as N Phosphate, as P Sulfate	ND ND 3.7	ND ND 2.6	ŧ
trans-1,3-Dichloropropene Trichloroethene Dibromochloromethane 1,1,2-Trichloroethane				Detection limit factor: Analysis date:	11/13/86	12/16/86	1 12/16/86
cis-1,3-Dichloropropene Chloroethylvinyl ether	Q Q Q	229	<u>9</u> 9	Total Dissolved Solids (ug/l)	130	140	140
bromeiorm 1,1,2,2-Tetrachloroethane Tetrachloroethene Chlorobenzene		ON NO.	2222	Detection limit factor: Analysis started:	11/13/86	12/15/86	12/15/86
Ulchlorobenzenes	Q ,	ON ,	ğ ,	Mineral Results (mg/l)			
Detection limit factor: Surrogate Recovery, % Analysis Date:	90 11/17/86	1 95 12/19/86	77 12/19/86	•	7.3 0.19 3.4	7.6 0.033 3.5	7.5 0.17 3.5
8020 Results (ug/l)				Potassium, K Sodium, Na	1.4 1.4 16	0.15 1.5 13	
Benzene Chlorobenzene 1,2-Dichlorobenzene 1,4-Dichlorobenzene 1,4-Dichlorobenzene Ethylbenzene Toluene	<u> </u>			Detection limit factor: Analysis date (ICP): Analysis date (K):	01/20/87 01/19/87	1 01/21/87 01/19/87	1 01/21/87 01/19/87
Detection limit factor: Surrogate Recovery, %	98	1 95	1 83	* Da	Data for nitrate/nitrite invalid, holding tine exceeded	itrite invalid, eded	
Analysis Date:	11/17/86	12/19/86	12/19/86		þ		

Groundwater sampling results for Well MAFB-51 at Mather AFB, California - ACW DISPOSAL SITE N-20. TABLE

11 11 11 11 11 11 11 11 11 11 11 11 11					
	Round 1 11/10/86 751	Round 2 12/13/86 653		Round 1 11/10/86 751	Round 2 12/13/86 653
601 Results (ug/l)	11 11 11 11 11 11 11 12 13 14 14 15 16 18 18 18 18 18 18 18 18 18 18 18 18 18	1 1 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	Alkalinity Results (mg/l)		# # # # # # # # # # # # # # # # # # #
Chloromethane Bromomethane Dichlorodifluoromethane	ON ON	UN QU	Bicarbonate Alk., as CaCO3 Carbonate Alk., as CaCO3 Hydroxide Alk., as CaCO3	4 7 ND ND	59 UN ON
Vinyl chloride Chloroethane Methylene chloride	ND ND 1.1	ND ND 1.0 a	late:	11/21/86	12/17/86
Trichlorofluoromethane 1,1-Dichloroethene 1,1-Dichloroethane	ON OR	ON O	429 Results (mg/l)		
trans-1,2-Dichloroetnene Chloroform	QN	Q Q	Browide	0.2 3.8	ND 3.5
1,2-Dichloroethane 1,1,1-Trichloroethane	QN QN	QN QN	e:	0.2	0.0
Carbon tetrachloride Bromodichloromethane	ON ON	QN QN	, 2	QN QN	QN QN
1,2-Dichloropropane trans-1,3-Dichloropropene	QQ	ON N	Sulfate	2.5	2.1
Trichloroethene Dibromochloromethane 1,1,2-Trichloroethane			Detection limit factor: Analysis date:	1 11/12/86	1 12/16/86
Chloroethylvinyl ether	201		Total Dissolved Solids (mg/l)	(1) 170	120
1,1,2,2-Tetrachloroethane Tetrachloroethene Chlorobenzene		200	Detection limit factor: Analysis started:	1 11/12/86	1 12/15/86
Dichlorobenzenes	2 -	Q ,	Mineral Results (mg/l)		
Surrogate Recovery, % Analysis Date:	1 83 11/14/86	72 12/19/86	Calcium, Ca Iron, Fe Magnestim Mg	8.3 0.037 4.4	11 0.018
8020 Results (ug/l)			Manganese, Mn Potassium, K	0.06	0.013 5.4
Benzene Chlorobenzene 1, 2-Dichlorobenzene 1, 3-Dichlorobenzene 1, 4-Dichlorobenzene Ethylbenzene Toluene Total Xylenes			Detection limit factor: Analysis date (ICP): Analysis date (K):	01/20/87 01/19/87	1 01/21/87 01/19/87
Detection limit factor: Surrogate Recovery, %	1 83	1 75	Data for nitrate/nitrit holding time exceeded	Data for nitrate/nitrite invalid, holding time exceeded	
Analysis Date:	11714786	12719786			

Groundwater sampling results for Well MAFB-52 at Mather AFB, California - ACW DISPOSAL SITE. TABLE N-21.

	Round 1 11/10/86 752	Round 2 12/12/86 644		Round 11/10 75	Round 2 12/12/86 644
601 Results (ug/1)	17 18 18 18 18 18 18 18 18 18 18 18 18 18	d d d d d d d d d d d d d d d d d d d	Alkalinity Results (mg/l)	9/1)	3
Chloromethane Bromomethane Dichlorodifluoromethane	ON ON ON ON	ON ON ON ON ON ON ON ON ON ON ON ON ON O	Bicarbonate Alk., as CaC03 Carbonate Alk., as CaC03 Hydroxide Alk., as CaC03	67 ND ND	59 ND ND
Vinyl chloride Chloroethane Methylene chloride	ND ND 1.0 a		Analysis date:	11/21/86	12/17/86
Trichlorof luoromethane 1, 1-Dichloroethene	O O I	Q Q i	429 Results (mg/l)		
1,1-Dichloroethane trans-1,2-Dichloroethene	22	Q Q	Bronde	4.0	QN V
Chloroform	2 2		Chloride	v.0	0.2
1,1,1-Tichloroethane	2	2	Nitrate, as N	3.6	4
Carbon tetrachloride Bromodichloromethane		22	Nitrite, as N Phosphate, as P	Q Q	ON CIN
1, 2-Dichloropropane	2	2		6.7	4.3
trans-1,3-Dichloropropene Trichloroethene	MD 4.1	5.7	Detection limit factor:	7	-
Dibromochloromethane	25	<u>Q</u> 5	Analysis date:	11/12/86	12/14/86
1,1,2-IficalOrdecame cis-l,3-Dichloropropene Chloroethylvinyl ether			Total Dissolved Solids (mg/l)	1/1) 190	200
Bromoform	Q.	Q			
1,1,2,2-Tetrachloruethane Tetrachloroethene Chlorobenzene	O O O	Q Q Q	Detection limit factor: Analysis started:	1 11/12/86	1 12/14/86
Dichlorobenzenes	QN	QN	nineral Results (mg/l)		
Detection limit factor:	-	7			
Surrogate Recovery, &	103	73	Calcium, Ca	11	12
Analysis Date:	11/1//86	98/77/71	Magnestim Mg	4.0.0	0.0/3
8020 Results (ug/l)			Manganese, Mn Potassium, K Sodium Na	0.008	0.014 1.9
Benzene	ND	QN	•	,	1
Chlorobenzene	2	2	Detection limit factor:	1 01/20/87	1
1,2-Dichlorobenzene 1,3-Dichlorobenzene	S S	ON ON	Analysis date (K):	01/19/87	01/19/87
1,4-Dichlorobenzene Frhulbenzene	<b>S</b>	<b>2</b> 2			
Toluene Total Xvlenes	0 0 C				
	<b>!</b>				
Detection limit factor: Surrogate Recovery, %	103	73			
Analysis Date:	11/17/86	12/22/86			

Groundwater sampling results for Well MAFB-53 at Mather AFB, California - ACW DISPOSAL SITE N-22. TABLE

	Round 1 11/11/86 754	Round 2 12/12/86 645		Round 1 11/11/86 754	Round 2 12/12/86 645
	好 好			H H H H H H H H H H H H H H H H H H H	4 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5
601 Results (ug/l)			Alkalinity Results (mg/l	_	
Chloromethane Bromomethane Dichlorodifluoromethane		Q Q Q	Bicarbonate Alk., as CaC03 Carbonate Alk., as CaC03 Hydroxide Alk., as CaC03	4 3 ND ND	47 ND ND
Vinyl chloride Chloroethane Methylene chloride	2		Analysis date:	11/21/86	12/17/86
Trichlorof luoromethane 1,1-Dichloroethene		2 Q Q	429 Results (mg/l)		
t,i-Dichiorocthene trans-1,2-Dichlorocthene Chloroform		2 S S	Bromide Chloride	ND 7.7	3.7
1,2-Dichloroethane	25	ON CA	•	5.0	0.0
Carbon tetración	229	229	2 2 3	. Q	J Q X
Bronodichioromethane 1,2-Dichloropropane	229	299	Phosphate, as P Sulfate	ND 5.7	ND 2.1
trans-1,3-Dichloropropene Trichloroethane Dibromochloromethane			Detection limit factor: Analysis date:	11/12/86	1 12/14/86
cis-1,3-Dichloropropene Chloroethylvinyl ether	999	99	Total Dissolved Solids (mg/l)	11) 100	89
bromoform 1,1,2,2.Tetrachloroethane Tetrachloroethene Chlorobenzene		2002	Detection limit factor: Analysis started:	1 11/12/86	1 12/14/86
Dichlorobenzenes		Q <b>X</b>	Mineral Results (mg/l)		
Detection limit factor: Surrogate Recovery, % Analysis Date:	1 81 11/14/86	1 55 12/22/86	Calcium, Ca Iron, Fe Magnesium, Mg	7.8 0.11 3.1	7.7 0.02 3.3
8020 Results (ug/l)			Manganese, Mn Potassium, K Sodium, Na	ND 2.6 14	ND 2.3 10
Benzene	2	Q.		•	
Chlorobenzene 1, 2-Dichlorobenzene 1, 3-Dichlorobenzene 1, 4-Dichlorobenzene Ethylbenzene			Detection limit factor: Analysis date (ICP): Analysis date (K):	01/20/87 01/19/87	01/21/87 01/19/87
ioluene Total Xylenes	UD ND	QN D			
Detection limit factor: Surrogate Recovery, %	81	6.1			
Analysis Date:	11/14/86	12/22/86			

Groundwater sampling results for Well MAFB-54 at Mather AFB, California - ACW DISPOSAL SITE N-23. TABLE

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	11/11/86 756	12/13/86 649		756	Round 2 12/13/86 649
601 Results (uq/1)		11 11 11 11 11 11 11 11 11 11 11 11 11	Alkalinity Results (md/l)		01 04 05 04 04 04 04 04 04 04
•			•		
Chloromethane	2	<b>Q</b>	Bicarbonate Alk., as CaCO3	121	110
Bromomethane	2 1		darbonate AIK., as cacus	QN:	
Dichlorodii luoromethane Vinvi chloride	25	<b>3 5</b>	nyaroxide Aik., as tatus	CM.	ON
Vinyi chici ide Chlorofibane	2 5		Analysis date:	11/21/86	12/17/86
Methylene chloride	2	Q.		00/17/11	99//1/71
Trichlorof luoromethane	2	9			
1,1-Dichloroethere	29	2	429 Results (mg/l)		
I, I-Dichloroethane	2	29		•	:
crans-1,2-Dichloroethene	2 %	25	Drog de	7.00	0.5
1.2.Dichloroethane	Q Z	2	Fluoride	7.C	6.7
1.1.1-Trichloroethane	QN	Q	4	, m	1,0
Carbon tetrachloride	Q	QN		CZ	C.N.
Bromodichloromethane	ΩN	QN	e ,	QN	Q
1,2-Dichloropropane	QN	Ð	Sulfate	3.5	4.3
trans-1,3-Dichloropropene	QN	QN			
Trichloroethene	QN	QN	Detection limit factor:	~	7
Dibromochloromethane	QN	QN	Analysis date:	11/12/86	12/16/86
1,1,2-Trichloroethane	QN	QN			
cis-1,3-Dichloropropene	QN	QN			
Chloroethylvinyl ether	Q !	Q	Total Dissolved Solids (mg	(mg/l) 150	130
Brosof or s	Q.	2		•	
Tetrachloroethane		QN	Detection limit factor:	-	1
Tetrachloroethene	Q	QN	Analysis started:	11/12/86	12/15/86
Chlorobenzene	Q	2			
Dichlorobenzenes	CIN.	NTO	M. ( ) See ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) See ( ) S		
		-	Mineral Results (mg/1)		
Detection 1181t 18tholes	7 6	• • • • • • • • • • • • • • • • • • • •	a) mitolet	ď	5
Just Date .	11/24/86	12/19/86	Iron Fe	200	0.45
	:		Megnestur, Mg	. 4 	6.0.0
				660	000
BOOD Deanly a (1771)				270:0	0.009
(1) STIPES OZOG			Sod tile	۲.1	6.7
Renzene	QN	QN	5:	•	77
Chlorobenzene	C	CW	Detection limit factor:		-
1.2.Dichlorobenzene	2	Q.	Analysis date (ICP):	01/20/87	78/16/10
1 3-Dichlorobenzene	CZ	QN.	Analysis date (K):	01/19/87	01/10/67
1 A. Dichlorobenzene	Ş		,		10/17/10
Fith Dentend	2	i S			
Toluene	2	QN			
Total Xylenes	QN	QN			
Detection limit factor:	1	-	/ · · · · · · · · · · · · · · · · · · ·	1. 1	
Surrogate Recovery, *	86	104		nitrite invalid,	
			מסומווות חוווב בצרבבחבם	בבחבח	
Analysis (a Date.	20.10.11				

Groundwater sampling results for Well MAFB-55 at Mather AFB, California - 7100 DISPOSAL AREA N-24. TABLE

Atomic Absorption Metal  ND NO Certific As  ND NO Certific As  ND NO Certific As  ND NO Certific As  ND NO Certific As  ND NO Certific As  ND NO Certific As  ND NO Certific As  ND NO Certific As  ND NO Certific As  ND NO Certific As  ND NO Certific As  ND NO Certific As  ND NO Certific As  ND NO Certific As  ND NO Certific As  ND NO Certific As  ND NO Certific As  ND NO Certific As  ND NO Certific As  ND NO Certific As  ND NO Certific As  ND NO Certific As  ND NO Certific As  ND NO Certific As  ND NO Certific As  ND NO Certific As  ND NO Certific As  ND NO Certific As  ND NO CERTIFIC AS  ND NO CERTIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND NO CERTIFIC AS  ND CETIFIC AS  ND NO CERTIFIC AS  ND CETIFIC AS  ND NO CETIFIC AS  ND CETIFIC AS  ND NO CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC AS  ND CETIFIC  ND CETIFIC  ND CETIFIC  ND CETIFIC  ND CETIFIC  ND CETIFIC		Round 1 11/17/86 794	Kound 2 12/09: 8c 613			Readed 2 12709-80 6.13
10   10   10   10   10   10   10   10	601 Results (ug/1)			Atomic Absorption Hetal	kesulta (ug/1)	
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1	rl chloride		Î		ì	•
March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   Marc	ylene chloride hlorofluoromethane Dichloroethene	1 9 9 9 1 7 9 9 9	ÎÎÎ	Analysis date (As. 16). Analysis date (Se).	98710771 11776786	17.17.86
Miles	Dichloroethane is 1,2-Dichloroethene		<u> </u>	Alkalinity Results .my/	_	
Malysis date:	noids Bichloroethane I Trichloroethane on tetrachlorida		222	Bicarbonate Alk., as CaCO 5 Carbonate Alk., as CaCO 5 Modernate alk., as CaCO 5	<b>5</b> 7 7 <b>2</b>	9 1
NO	odichloromethane Dichloropropane se 1.3 Dichloropropane		225	Analysis date:	11721786	12/16/86
Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Mail	hloroethene omochloromethane		221	429 Results (uq/1)		
	1, 3 Dichloropropene		221	もでは最から発	9	9
NO	boform		<b>2</b> 2 :	Fluoride	Ē	ž.
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1	Chlorobenzene Dichlorobenzenes		22	_	€ 3	20
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1   Metal Results (Math.)   1   1   1   1   1   1   1   1   1	i, a Dichiolobeniene Ethylbenzene Tuluene Tutal Xylenes	1922		Detection limit factor. Analysis started:	1 11 - 1 H : Be.	12 10786
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				Paraction blant to re- Analysis late 10 Analysis date 10	7 e s 2 7 7	: = ; ; -; 2 -; 3

Groundwater sampling results for Well MAFB-56 at Mather AFB, California 7100 DISPOSAL AREA N-25. TABLE

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601 Results (ug/1)

Chloromethane
Dichlorodiffluorumethane
Vinyi chloride
Chloroethane
Kethyi ene chloride
Kethyi ene chloride
Kethyi ene chloride
Li Dichloroethane
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trana 1.2 Dichloroethane
Li Ji Trichloroethane
Li Ji Dichloropene
Roumodichloromethane
Li Ji Dichloropene
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Li Ji Dichloropene
Trichloroethane
Canbor ethere
Dibromochhoromethane
Li Ji Dichloropene
Chloroethylvinyl ether
Ghoroethylvinyl ether
Ghorothylvinyl ether
Chlorobenece

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Fround 1 11, 18: 8c 800	Found 2 12/11/06 6.35		Roand 1 11718786 800	R canal 7, 12, 11, 11, 11, 11, 11, 11, 11, 11, 11	
:		Atomic Absorption Netal Results (ug/1)	Results (ug/1)		
<u> </u>	ŻŹŹ	Arsenic, As Mercury, Hy Selention, Se	- <u>- 2 3</u>	ŽŽ	
<u> </u>	339 <u>8</u>	Detection 1mlf factor: Analysis date (As.fkg). Analysis date (Se):	1 20 86 11 01:86	- 8 3 1 2 1 - 1 2 1 - 1 2 1 - 1 2 1	
ON O	Î	Ž	2		
<u> </u>	<u>P</u>	Bivarbonate Alk., as CaCus Carbonate Alk., as CaCus Hydroxide Alk., as CaCus	N CO O O	ପ୍ୟକ୍ତି	
221	222	Analysis date:	99. 17.11	15.1.784	
	<u> </u>	429 Results (mg/l)			
<u>2</u> 21	<u> </u>	Browlide Chloride	₹ ₹ - \$ 2.4	24 0 <del>4</del>	
ŽŽ	Ź	Fluoride Naturale, as N	# 77 7 0 0 7 7 0	7 B	
222	2 2 2 2 2 2 2	Nitrite, as N Physphate, as F Sulfate	<b>ੈ</b> ਕਰਨ <u>ਹੁੰਦੇ</u>	<b>5 3</b> 5	
12		Detection itmit factor. Analysis date:	117.217.86 1	- # - #	
11/21/86	20,77.71	Total Cyanides (my/1)	50.0	Ü	
ĝ	Î	Detection limit factor. Analysis date:	1 11 - 26 : 89 :	- ss	
2 <b>2 2</b>	2 2 ï	Total Dissolved Soilds (my/)		140	
2221	<u> </u>	Serection limit factor: Analysis startes.	11:21:46	m 21 22	
<b>ž</b> -	-	Metal Results (ug/1)			
11 . 11 86.	<u>5</u> # : 	Bartum, Ba	r. 89	#3	
		Cadmium, Cd Chromium, Cr Ecad, Pb Silver, Ad	GN ON ON ON	<u> </u>	
		Detection (Imit factor) Analysis date that Analysis date (Others):	1 017.217.00 017.20.47	7 8 17 10 8 17 10 10	
papaaax		Mineral Results (mg 1)			
		Calchon, Ca Front, E Manneston, My Manneston, My Manneston, My Establish, Na Soullum, Na	7. B. 3. C. V. 4. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S. C. S.	01 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
		Detection Hauf Entor Analysis interafile Analysis date (b)	7 8 8 6 7 7 8 8 6 7 7 8 8 6 7 8 8 8 6 7 8 8 8 8	1 1 1 3	

8020 Results (ug/l)

Benzene f. Nuorobenzene i. 2. Dichlorobenzene i. 4. Dichlorobenzene Erkyl benzene Tolurene

Detection limit factor. Surrogate Recovery, A. Analysis Date.

Detection limit factor: Surrogate Recovery, & Analysis Date:

* Data invalid, holding time exceeded

Groundwater sampling results for Well MAFB-57 at Mather AFB, California 7100 DISPOSAL AREA N-26. TABLE

Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marrier   Marr		Round 1 11718786 797			H sand 1 11-10 00	
Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue   Continue	501 Results (ug/1)			Atomic Absorption Hetal	Kesults (144/1)	
March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   Marc	romethane		Ñ	Argente, As Necoury, Hy	ŹŹ	Ž
1.2   10   10   10   10   10   10   10   1	orodifluoromethane		22	Selection, Se	È	Ē
Main	Toethane		<u> </u>	Application times the terms.	11:26:36	- 980 - 7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Mail	Morof Loronethane		22.5	Analysis date (Se).	17/01/96	12/17/86
Main	orchioroethene Orchioroethane		2			
Main	1,2 Dichloroethene		Î			•
10	Dichloroethane		<u> </u>	Carbonate Aik., as (a(0)	Ę	, Ē
Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Maily   Mail	on tetrachloride		êi	Hydroxide Alk., as Caro!	ž	Ē
March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   Marc	odichioropechane Dichloropropane		2	Audiyala date:	11.21.86	12717786
March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   March   Marc	s 1, 3 Dichloropropene hloroethene		221			
Miles	paochlor one thane		2 2	TO THE STREET AND THE		
NEW   Continue   Con	1,3 Dichloropropene		2	hr omide	- <del>-</del>	
Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Microscope   Mic	roethylvinyl ether		22	Fluoride	, o	
MD	2,2 Tetrachloroethane		2	Witrate, as N		- 3
Detection limit factor   11/19/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/86   12/12/	ach lor oethene		2 1	District, on N	- <u>3</u>	Ê
1	robenzenes lorobenzenes		9	Sulfate .	2	<b>9</b> -1
11/21/86	ction limit factor:	-	- 9	Detection limit factor:	- 4	- 1
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Groundwater sampling results for Well MAFB-58 at Mather AFB, California - 7100 DISPOSAL AREA N-27. TABLE

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Groundwater sampling results for Well MAFB-59 at Mather AFB, California - 7100 DISPOSAL AREA N-28. TABLE

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TABLE N-29. Groundwater sampling results for MAFB-60 at Mather AFB, California - WEST DITCH

Chicroestante (ug/1)  Chicroestante (ug/1)  Chicroestante (ug/1)  Chicroestante (ug/1)  Chicroestante (up		Round 1 11/14/86 7/4	Round 2 12/09/86 609		Hound 1 11/14/86 774	Round 2 12/09/86 609
Bicarbonate Alk., as CacO3    86	601 Results (ug/1)	11 13 13 14 14 16 11	1	Alkalinity Results (mg/	(1)	:
Detection   No.    Chloromethane	QN	QN	Bicarbonate Alk., as CaCO3	986	94	
Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Maintaine   Main	Bromomethane		Ĉ Î	Carbonate Alk., as CaCO3		2
NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW	Dichlorodin luoromethane Vinvi chloride	2 2	e e	nyarbxide Aik., as cacos	ž	(N
H.0 a   N	Chloroethane	Q	QN	Analysis date:	11/21/86	12/16/86
NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW   NEW	Methylene chloride Trichlorofluoromethene	8.0 a				
N	1, 1-Dichloroethene	Q Q	<b>S</b>	429 Results (mg/l)		
No.	1,1-Dichloroethane	Q S	Q G		CIN.	۰ د
No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.	trans-1,2-Dichloroethene	2 2		Chloride Chloride	ND 24	10
NEW   NEW   NEW   NEW   NEW	1.2-Dichloroethane	2	ÎN	Fluoride	0.3	7.0
NEW Detection limit factor:   11/16/86   12/10   11/18/86   12/10   11/18/86   12/11   11/18/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86	1,1,1-Trichloroethane	QN	CIN	Nitrate, as N	ND	ÎN
NEW Departs, as P	Carbon tetrachloride	QN	QN	as N	QN:	Ŝ
NEW Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New Properties   New	Browodichloromethane		€ 5	n		Î
ND	1,2-Dichloropropane trans-1,3-Dichloropropene	Q Q	QN	מביי	90	21
ND	Trichloroethene	QN	ÛN	Detection limit factor:	1	-
ND	Dibromochloromethane 1,1,2-Trichloroethane	Q Q Q	Q QN	Analysis date:	11/16/86	12/10/86
ND	cis-l,3-Dichloropropene	QN	CI <b>N</b>			
No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.	Chloroethylvinyl ether		Q Z			110
ND	bromororm 1.1.2.2-Tetrachloroethane	2 2	G CX	Detection limit factor:		1
ND	Tetrachloroethene	QN	QN:	Analysis started:	11/15/86	12/10/86
1	Chlorobenzene		Q S			
1   1   1   1   1   1   1   1   1   1	Dichlorobenzenes		2	Mineral Results (my/l)		
11/18/86	Detection limit factor:	7	- 0	200		o o
ts (ug/l)  ts (ug/l)  ts (ug/l)  ts (ug/l)  ts (ug/l)  ts (ug/l)  ts (ug/l)  ts (ug/l)  ND  ND  ND  ND  ND  ND  ND  ND  ND  N		9/	601	Calcium, ca	7.8	B . 6
The control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the	Analysis Date:	11/18/86	12/11/86		0.042	0.016
1ts (ug/l)					0.011	0.003
ND	8020 Results (ug/l)				S	4.2
ND		;	Í	Sodium, Na	31	22
enzene         ND         ND         Analysis date (I(P):         01/20/87           enzene         ND         ND         Analysis date (K):         01/19/87           enzene         ND         ND         Analysis date (K):         01/19/87           formalia         ND         ND         ND           ft factor:         1         ND           overy, %         11/18/86         12/11/86	Benzene Chlorobangene			Detection limit factor:		_
ND         ND         Analysis date (K):         01/19/87           Senzene         ND         ND         ND           Senzene         ND         ND         ND           s         ND         ND         ND           sit factor:         1         1         1           covery, %         1/6         12.11/86         12.11/86	Circle Openicene	2	QN	Analysis date (ICP):	01/20/87	01/20/87
oenzene ND ND ND 6.7 s	1,3.Dichlorobenzene	QN	ON	Analysis date (K):	78/61/10	01/19/8/
s ND 6.7 ND ND 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1,4 Dichlorobenzene	Q S				
ND	Ethylbenzene Toluene	6.7	Î			
1 76 11/18/86 12/11	Total Xylenes	QN	NI			
11/18/86 12/11	Detection limit factor:	- 9	- 5			
_	Surfogate Recovery, a Analysis Date:	11/18/86	12,11786			

Groundwater sampling results for Well MAFB-61 at Mather AFB, California - WFST DITCH N-30. TABLE

	76	~ ~	<b>5</b> ≥ ₹		Kound	Round 2 12/09/86 605
601 Results (ug/l)	18 10 10 10 10 10 10 11 10 10 10 10 10 10	0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		Alkalinity Results (mg/l)	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Chloromethane	ΩN	QN	ÎN	Bicarbonate Alk., as CaCO3	05 66	g
Bromomethane	QN	QN	ON.	4	ND 22	) œ
Dichlorodifluoromethane	2	2	S S	Hydroxide Alk., as CaCO3		OIN
Chloroethane	Q	2 2	G X	Analysis date:	11/21/86 11/21/86	17714786
Methylene chloride	1.58	7	Q			00/01/71
Trichlorof luoromethane	2 2	2 2	<u> </u>	400 December 21		
1, 1 Dichloroethane	Q.	Q.	Q.	(I/bm) sathsay car		
trans-l,2-Dichloroethene	Q	QN	CIN.	Bromide		CN
Chloroform	2 5	2	9	Chleride		2.5
1, 2-Dichtoroechane 1, 1, 1-Trichloroethane	S S		GN S			ON)
Carbon tetrachloride	QN QN	Ž	Q N	Nitrite, as N		~ Z
Bromodichloromethane	QN	Q :	CIN	e, a		CIN
1,2-Ulchloropropade trans-1-3-Dichloropropage	O Z			Sulfate	6.1 6.1	3.8
Trichloroethene	QN	2	Q.	Detection limit factor:	1	~
Dibromochloromethane	S S	2	99	Analysis date:	11/14/86 11/14/86	12/10/86
cis 1,3-Dichloropropene	Q Q	È S	g N			
Chloroethylvinyl ether	QN	2	Q	Total Dissolved Solids (mg/l)	130 160	011
Bromoiorm 1 1 2 2.Tetracklerothere		3 2	28		•	
Tetrachloroethene	SS	2 2	Q.	Detection Innit factor: Analysis started:	1 1 1 1 4 / 8 6 1 1 / 1 4 / 8 6	70.731.76.1
Chlorobenzene	QN S	QN 2	Q.			30.707.77
	Q.	2	Z	Mineral Results (mg/l)		
limit fact		1				
Surrogate Recovery, %	103	68	66	Calctum, Ca		7.5
Analysis Late:	11/18/80	98/81/11	17/11/86	Magnessins Mg	0.28 0.035	0.000
8020 Results (ug/l)					•	· ·
Benzene	QN	QN	QN	Sodium, Na		1.
Chlorobenzene	QN	S	S	Detection limit factor:		_
1,2 Dichlorobenzene	Q.		<b>Q</b>	Analysis date (ICP):	01/20/87 01/20/87	78/07/10
1,3-Dichlorobenzene B				Analysis date (K):	01/19/87 01/19/87	01/19/87
Ethylbenzene	QN	ND	(IN			
Toluene Total Xylenes	ON ON	O N O N	CIN CIN			
	-	•	•			
Surrogate Recovery, *	103	89	- 66 66			
Armalvana Date.	11/18/86	117.18786	1.711.86			

Groundwater sampling results for Well MAFB-62 at Mather AFB, California - WEST DITCH N-31. TABLE

Continue		Round 1 11/14/86 777	Round 2 12/09/86 606		Round 1 11/14/86 777	Koand 2 12709/86 606
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ane		25		Browlde	GN	· · · 0
### Figure 1				Chloride	7.8	3.6
Name	, c-Dichloroethane	ON:	CIN.	Fluoride	0.3	N
No.	, l, l-Trichloroethane	2		ë	0.1	0.0
thane         ND         Phosphale, as P and a plane         ND         Phosphale, as P and a plane         ND         ND         Phosphale, as P and a plane         ND         ND <td>arbon tetrachloride</td> <td>QN</td> <td>ND</td> <td>ď</td> <td>CN</td> <td>CN</td>	arbon tetrachloride	QN	ND	ď	CN	CN
No	romodichloromethane	QN	ΩN		Î	, IN
Detection limit factor:   1   1   1   1   1   1   1   1   1	.2-Dichloropropane	CN	CN	;	(TE)	
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Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Detection   Dete	Trained decident			Detection limit factor:	7	~
Detection limit factor:   ND   ND   ND   ND   ND   ND   ND   N		ON.	Q.	Analysis date:	11/16/86	12/10/86
thylvinglether         ND         ND         Total Dissolved Solids (mg/l)         ND           farachloroctene         ND         ND         Total Dissolved Solids (mg/l)         ND           faracher         ND         ND         ND         Detection limit factor:         1           ncoethene         ND         ND         Analysis started:         11/15/86           ncoethene         ND         ND         Mn         Analysis started:         11/15/86           penzene         ND         ND         Mn         Analysis started:         11/15/86           penzene         ND         ND         Mn         Mn         ND           penzene         ND         Mn         Mn         ND         ND           penzene         ND         ND         ND         ND         ND         ND           placescarene         ND	, 1, 2-Trichloroethane	O.	QN.			
Total Dissolved Solids (mg/l)   ND	s-1,3-Dichloropropene	QN N	QN N			
ND	nloroethylvinyl ether	QN	QN			0.00
Tetrachloroethane	romoform	MD	QN			•
Interest   No.   Interest   Int	.1.2.2-Tetrachloroethane	CN	QN	Date of ton limit factor.	-	-
No	etrachloroethene	2 2	CIN	Applicate started:	1 1 2 5 7 1 5	1
Mineral Results (mg/l)   12   13   14   15   15   15   15   15   15   15	o lorobenzene	) <u> </u>	2	markets eration:	99/61/11	12/10/86
Mineral Results (mg/l)   12   12   13   12   12   14   14   15   15   15   15   15   15	(ch) probenzenea	. S	Ē			
11/19/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86   12/11/86	ירוויז כת החבוו לפוור פ					
Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   Sample   S	startion limit factor.	-	•	Alberal Results (mg/1)		
Second Street	COLUMN THE CARLOS	1 6	• 0		•	
Name		18			12	1.7
Name	halysis Date:	11/19/86	17/11/86	Iron, Fe	0.08	0.032
No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.					1.6	_
NE   NE   NE   NE   NE   NE   NE   NE					C	
ND	8020 Results (ud/1)					ָבָּרְיִּלְיִי
ND	1.69				7.7	١.٢
No	90000	W.D.	C/N	SOCION, NA	7 5	97
No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.   No.						
No	n or obenzene	2 :		Detection limit factor:	-	
ND   ND   ND   ND   ND   ND   ND   ND	. 2 - Dichlorobenzene	OK.	CIN .	Analysis date (ICP):	01/20/87	01/20/87
ND   ND   ND   ND   ND   ND   ND   ND	,3-Dichlorobenzene	QN	QN	Analysis date (K):	01/19/87	01/14/87
nzene ND ND ND ND ND ND ND ND ND ND ND ND ND	4 - Dichlorobenzene	QN	QN			10161110
ND Vlenes ND Dn limit factor:  ce Recovery, \$\frac{1}{3}\$ 81  Chate:  (bate:	thylbenzene	QN	ON			
Vienes ND On limit factor: 1 Se Recovery, % 81 State: 11/19/86 12/11/	oluene	CN	Î			
81	otal Xvlenes	CZ				
91 981 5						
81 2717.18	etection limit factor:	-	1			
11/19/86	urrodate Recovery, %	18	93			
38/61/11						
11/19/86						
	Analysis Date:	11/19/86	12/11/86.			

Groundwater sampling results for Well MAFB-63 at Mather AFB, California - WEST DITCH N-32. TABLE

	Round 1 11/13/86 766	Round 2 12708/86 602		Round 1 11/13/86 766	Kound 2 12708/86 602
601 Results (ug/1)	4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4		Alkalinity Results (mg/l)		
	•	•			
Unloromethane Bromomethane			Bicarbonate Alk., as CaCO3 Carbonate Alk. as CaCO3	<b>1</b> 56	4 2 CM
Dichlorodifluoromethane	2	2	Hydroxide Alk., as (a(0)	7 (IN	G EN
Vinyl chloride	QN	QN			1
Chloroethane		Q.	Analysis date:	11/21/86	12/09/86
Methylene chloride Trichlorofluoromethane	I.I.				
1, 1-Dichloroethene	2	2	429 Results (Bd/1)		
1,1 Dichloroethane	Q	GN			
trans-1,2-Dichloroethene	Q	GN	Bromide	ND	CIN
Chloroform	2	QN	Chloride	S.	5.2
1,2-Dichloroethane		QN	Fluoride	CI <b>X</b>	CN
1,1,1-Trichloroethane	Q.	Q		4.7	1.9
Proposition tetrachioride	0.1		Nitrite, as N	O.	e.o
bromodichloromechane	2 2		Flosphate, as P	(N)	CIN.
trans 1.3 Dichloropropene	2 2	2	מחומות	1.0	6.7
Trichloroethene	6.3	1.8	Detection limit factor:	-	
	ÛN	QN	Analysis date:	11/14/86	12/09/86
1,1,2 Trichloroethane	CIN	QN	•		
	QN	QN			
Chloroethylvinyl ether			Total Dissolved Solids (mg/l)	/1) 120	86
biomorphism 2	2 2		Detection 14m4 factors	-	
	12	=	Applicate started:	11/14/86	38760771
	2	QN	ייים וליון הנים נים:		20 / 0 / 7 1
Dichlorobenzenes	ND N	QN			
	•	•	Mineral Results (mg/l)		
Surrogate Recovery, &	78	119	Calcium, Ca	16	6.6
Analysis Date:	11/1/86	12/11/86	Iron, Fe	0.031	0.018
			Magnesium, Mg	C.1	0.27
BO20 Been   Fa (1977)			Manganese, Mn Dotage tim K	NIU 7 7	ON ?
(1 /hm) sathsay oron				12	• · · ·
Benzene	QN	6.0		1	2
Chlorobenzene	QN	(IN	Detection limit factor:	-	_
1,2 Dichlorobenzene	ON.	ND	Analysis date (ICP):	01/20/87	01/20/87
1,3 Dichlorobenzene	CN	ON.	Analysis date (K):	01/19/87	01/19/87
1,4 Dichlorobenzene	ON	ÎN			
Ethylbenzene	2	Û.			
Toluene					
total Ayrenes	2	) <b>L</b>			
limit fact	-				
Surrogate Recovery, %	87	119			
Analysis Date:	11/11/186	12/11/86			

Groundwater sampling results for Well MAFB-64 at Mather AFB, California - N.E. PERIMETER N-33. TABLE

Alkalinity Results (mg/l)  ND Carbonate Alk., as Ca(0)  ND Carbonate Alk., as Ca(0)  ND Min Malysis date:  ND Malysis date:  ND Min Houride  ND Chloride  ND Nitrate, as N  ND Nitrate, as N  ND Nitrate, as N  ND Nitrate, as N  ND Nitrate, as N  ND Nitrate, as N  ND Nitrate, as N  ND Nitrate, as N  ND Detection limit factor:  ND Detection limit factor:  ND Malysis started:  ND Malysis started:  ND Malysis started:  ND Malysis date (K):  MB Malysis date (K):  ND Malysis date (K):  ND Malysis date (K):  ND Malysis date (K):  ND Malysis date (K):  ND Malysis date (K):  ND Malysis date (K):  ND Malysis date (K):  ND Malysis date (K):  ND Malysis date (K):  ND Malysis date (K):  ND Malysis date (K):  ND Malysis date (K):  ND Malysis date (K):  ND Malysis date (K):  ND Malysis date (M):  Malysis date (M):  Malysis date (M):  Malysis date (M):  MB Malysis date (M):  MB Malysis date (M):  MB MB MB MB MB MB MB MB MB MB MB MB MB M		Round 1 11/14/86 775	Round 2 12/10/86 6/8		Found 1 11/14/86	Round 2 12/10/86 618
ND	9/1)	1 0 0 0 0 9 9 10 0 0 0		d d		:
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N	)ichlorodifluoromethane	Q !	CIN T	Hydroxide Alk., as CaCO3	QIN	Ñ
NEW Properties   NEW Properties	inyl chloride	Q (	<u>CN</u>			
ND	nioroethane		Ž	Analysis date:	11/21/86	12/11/86
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iffuloroethane ND ND ND ND Total Dischloroethane ND ND ND ND ND ND ND ND ND ND ND ND ND	ibromochloromethane	Q.	Q	Analysis date:	11/17/86	12/11/86
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Tetrachloroethane ND ND ND Analysis ND Perection ND ND ND ND ND ND ND ND ND ND ND ND ND	romoform	2				9
ND	1.2.2-Tetrachloroethane	Q	QN	Detection limit factor:		_
### Process    ND	etrachloroethene	2	QN	Analysis started:	11/17/86	12/11/86
ND   ND   Mineron	hlorobenzene	QN	CIN	•		
Part factor:  1 1 12 Calcium, be Recovery, \$ 89 11712/86 1170n, Fe Hagnesiu Hanganess  3 Results (ug/l)  Personate ND ND ND Hanganess  Alorobenzene ND ND ND Detection ND ND ND ND ND ND ND ND ND ND ND ND ND	<b>ichlorobenzenes</b>	QN	ND			
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Sesuits (ug/l)  Results (ug/l)  Results (ug/l)  ND  ND  ND  ND  ND  ND  ND  ND  ND  N	Recovery,	500	1112		2.1	3.3
Results (ug/l)  ND ND ND ND ND ND ND ND ND ND ND ND ND	nalysis Date:	11/19/86	12/12/86		0.13	0.12
Results (ug/l)  ND  ND  ND  ND  ND  ND  ND  ND  ND  N					0.15	0.47
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nzene ND ND Detection ND ND Detection ND ND ND ND ND ND ND ND ND ND ND ND ND	BOZO Results (ug/1)				7.5	<b>4.</b>
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. 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	otal Xylenes	Q.	Ŝ			
89 112						
*	etection limit factor: urrodate Recovery, %	1 89	11.2			
	•				ling time exceede	<b>т</b> о
Analysis Date: 11/19/86 12/12/86	na Junia Data.	11/19/86	12712786			

Groundwater sampling results for Well MAFB-65 at Mather AFB, California - N.E. PERIMETER N-34. TABLE

	Round 1 11/15/86 779	Round 2 12/10/86 615		Round 1 11.15/86 779	
(ug/1)			Alkalinity Results (mg/l)	9	
Chloromethane Bromomethane Dichlorodifluoromethane	ON ON ON	QN QN QN	Bicarbonate Alk., as CaC03 Carbonate Alk., as CaC03 Hydroxide Alk., as CaC03	O Q Q Q	O'S CIN CIN CIN
Vinyl chloride Chloroethane Methylene chloride Trichlorofluoromethane	ND ND S.2 a ND	ND ND 1.7 a	Analysis date:	11/21/86	12/16/86
1,1-Dichloroethene 1,1-Dichloroethane trans-1,2-Dichloroethane Chloroform 1,2-Dichloroethane 1,1,1-Trichloroethane Carbon tetrachloride Bromodichloromethane			Browlde Chloride Fluoride Nitrate, as N Phosphate, as P	0.1 7.3 7.3 0.5 ND	2.0 2.0 2.8 2.1 4.1 0.0 0.0 0.0
1,2-Dichloropropane trans-1,3-Dichloropropene Trichloroethene Dibromochloromethane 1,1-Z-Trichloroethane			Sulfate  Detection limit factor:  Analysis date:  Total Dissolved Solids (mo	15 1 11/17/86 (mq/l) 96	12/11/86
Chloroethylvinyl ether Bromoform 1,1,2,2-Tetrachloroethane Tetrachloroethene Chlorobenzene			factor: d: lts (mg/	11/17/	12/12/86
Detection limit factor: Surrogate Recovery, & Analysis Date: 8020 Results (ug/1)	1 74 11/19/86	1 114 12/12/86	Calcium, Ca Iron, Fe Magnesium, Mg Manganese, Mn Potassium, K Sodium, Na	8.7 0.01/ 3.4 ND 1.8	7.7 4.00.00 4.60.00 3.00.00
Benzene Chlorobenzene 1,2-Dichlorobenzene 1,3-Dichlorobenzene 1,4-Dichlorobenzene Ethylbenzene Toluene	99999999		Detection limit factor: Analysis date (ICP): Analysis date (K):	1 01/20/87 01/19/87	01721787 01719787
Detection limit factor: Surrogate Recovery, % Analysis Date:	1 74 11/19/86	1.14 1.14 1.271.2786			

Groundwater sampling results for Well MAFB-66 at Mather AFB, California - N.E. PERIMETER N-35. TABLE

			j	\min \min \min \min \min \min \min \min	
	Round 1 11/15/86 781	Round 2 12/10/86 620		Found 1 11/15/86 781	Ecound 7 12/10/86 620
	0 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			
601 Results (ug/1)			Alkalinity Results (mg/l)	1)	
Chloromethane	QN	QN	Bicarbonate Alk., as CaCO3	6.4	36
Bromomethane Dichlorodifluoromethane	20		Carbonate Alk., as CaCO3 Hydroxide Alk., as CaCO3	e Z	ON S
Vinyl chloride	2	CN.			
Chloroethane		ON N	Analysis date:	11/21/86	12/17/86
metnytene chiorine Trichlorofluoromethane	S QN	Q Q			
1,1-Dichloroethene	ON ON		429 Results (mg/l)		
trans-1,2-Dichloroethene	Q Q	Q Q	Bromide	(IN	0.3
Chloroform	Q i	<b>Q</b> :	Chloride	6.8	3.3
1, 2-Dichloroethane		25		<b>6.</b> 0	QN :
Carbon tetrachloride			Nitrite sa N	7.7	4.0
Bromodichloromethane	QN	£	, a	QN	ÎN
1,2-Dichloropropane	2	<b>Q S</b>	Sulfate	49	6.4
Trans-1,3-Dichloropropene Trichloropthene			Detection limit factor.	-	
Dibromochloromethane	2	Q	Analysis date:	11/17/86	12711786
1,1,2-Trichloroethane	Q S	2			
Cis-1,3-Dichloropropene				-	Š
Bronoform	Q Q	S N	Torai Dissolved Solids (mg/1)	041	79
1,1,2,2-Tetrachloroethane	Q.	QN.	limit	-	-
Tetrachloroethene	2	<b>S 1</b>	Analysis started:	11/17/86	12/11/86
Chlorobenzene Dichlorobenzenes	N N	Q Q			
		-	Mineral Results (mg/1)		
limit ract	<b>-</b> 0	10		1	
Surrogate Recovery, 4 Analysis Date:	93	12/12/86	(alclum, Ca	4.7	5.7
			ä	0.24	0.32
				(JN)	CIN
8020 Results (ug/1)			Potensies, K	اران 14 م	/ · *
Benzene	QN	QN	Souther, Na	60	<u>c</u>
Chlorobenzene	QN	QN.	Detection limit factor:	-	_
1,2 Dichlorobenzene	2	Q ii	Analysis date (ICP):	01/20/87	01/21/87
1,3 Dichlorobenzene			Analysis date (K):	01/19/87	/8/61/10
Ethylbenzene	2 2	CN CN			
Toluene	QN.	Û.			
Total Xylenes	Q <b>N</b>	N)			
	-				
Surrogate Recovery, *	93	101			
Analysis Date:	31/19/86	12/1/86			

Groundwater sampling results for Well MAFB-67 at Mather AFB, California - ACW DISPOSAL SITE N-36. TABLE

	Round 1 11/12/86 759	Round 2 12/13/86 657		Round 1 11/12/86 759	Round 2 12/13/86 657
601 Results (ug/1)	d d d d d d d d d d d d d d d d d d d	1 d d d d d d d d d d d d d d d d d d d	Alkalinity Results (mg/l)	(1)	
Chloromethane	Q	ON	Bicarbonate Alk., as CaCO3	83	\$ ¹
Bromomethane Dichlorodifluoromethane	Q Q	a S	Carbonate Alk., as CaCO3 Hydroxide Alkse CaCO3	ON O	Ŝ
Vinyl chloride	Q	GN	constant the same same		
Chloroethane	QN,	QN (	Analysis date:	11/21/86	12/17/86
Metnylene chloride Trichlorofluoromethane	ND a	ND A			
l,l-Dichlorethene	Q Q	C Z	429 Results (mg/l)		
trans 1, 2 - Dichloroethene	2	QN	Bromide	0.1	3.0
Chloroform	8	QN	Chloride	18	<b>4</b>
1,2-Dichloroethane	<b>3</b> 5	Q		9.0 0.0	F. 0
1,1,1-irichioroethane Carbon tetrachloride			Nitrate, as N	7 · 0 N	
Bromodichloromethane	Q	Q	, a	G	
1,2-Dichloropropane	2	S.	Sulfate	28	7.6
trans-1,3-Dienioropropene Trichloroethene	2 2		Detection limit factor:	-	
Dibromochloromethane	Q	Q.	Analysis date:	11/13/86	12/16/86
1,1,2 Trichloroethane	<b>Q S</b>	QN S	•		
2 Chloroethylvinyl ether	Q Q	Q Q	Total Dissolved Solids (mg/l)	q/1) 140	120
Bromoform	Q :	QN			-
1,1,2,2-Tetrachioroethane Tetrachloroethene			Detection limit factor: Analymia started:	11/13/86	12/15/86
Chlorobenzene	Q q	29			
	2	Ē	Mineral Results (mg/l)		
fact	7				
Surrogate Recovery, %	980	105	Calcium, Ca	6.4	7.1
Analysis Date:	11/14/95	17,77,86		<b>\$</b> 70.0	740.0
			Mangapese, Ma	O.N.	0.003
8020 Results (ug/1)				2.3	~
	;	;		46	16
Benzene Chlorobessese				_	_
1,2-Dichlorobenzene	g S	2 2	Detection inmit ractor: Analysis date (ICP):	01/20/87	01/21/87
1,3-Dichlorobenzene	QN	QN	Analysis date (K):	01/19/87	01/19/87
1,4 -Dichlorobenzene	QN S	CN:			
Ethyibenzene Toluene					
Total Xylenes	QN	QN			
Detection limit factor:	~		Data for nitrate/nitrite invalid,	itrite invalid,	
Surrogate Recovery, %	80	104	holding time exceeded	papa	
Analysis Date:	11/14/86	12/22/86			
•					

Groundwater sampling results for Well MAFB-68 at Mather AFB, California - ACW DISPOSAL SITE N-37. TABLE

	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 1 1 1 1 1			
	d 1 /86 0	Round 2 12/13/86 655		Round 1 11/12/86 760	Round 2 12/13/86 655
601 Results (ug/l)	0 6 0 6 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	교 대 대 대 대 대 대 대 대 대 대 대 대 대 대 대 대 대 대 대	Alkalinity Results (mg/l)		1 1 년 대 대 대 대 대 대 대 대 대 대 대 대 대 대 대 대 대 대 대
	S	ğ	Bit a throughout and the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contraction of the contrac	949	0.4
Brosethane	S S	<b>S S</b>	Carbonate Alk., as CaCO3	QN	QN
Dichlorodif luoromethane	29	29	Hydroxide Alk., as CaC03	ND	(IN
Chloroethane	Q	<b>Q Q</b>	Analysis date:	11/21/86	12/17/86
Methylene chloride Trichlorofluoromethane	1.4 a ND	Q Q			
1,1-Dichloroethene	29	29	429 Results (mg/l)		
1,1-Dichioroethane trans-1,2-Dichloroethene	22	2 2	Browide	QN	0.4
Chloroform	Q	ΩN	Chloride	5.6	2.4
1,2-Dichloroethane	2	<b>Q</b> !		0.3	0.2
1,1,1-Trichloroethane		2 5	Nitrate, as N	0 . 4 NI	2 2
Bromodichloromethane	2 2	2 2	- 41	Q Q	* 22
1,2-Dichloropropane	2	QN		9.1	4.5
trans-1,3-Dichloropropene	2	Q		•	•
Trichloroethene			Detection limit factor:	1 / 2 / 2 / 1 / 1 / 1	1 12/16/86
1,1,2-Trichloroethane	2 2	S			
cis-1,3-Dichloropropene	QN	ΩN			:
2-Chloroethylvinyl ether		QN N	Total Dissolved Solids (m	(mg/1) 81	58
l.1.2.2-Tetrachloroethane	2	Q	Detection limit factor:	1	-
Tetrachloroethene	Q	Q.	Analysis started:	11/13/86	12/15/86
Chlorobenzene	2 5	2 2			
	<b>}</b>	€	Mineral Results (mg/l)		
limit fact		7			(
Surrogate Recovery, %	74	96	Calcium, Ca	0.036	50 P
maryara Date:	00 / 11 / 11	16, 23, 66	ė	3.1	3.1
				QN	QN
8020 Results (ug/l)			Potessica, K	7	2.3
Benzene	NC	QN	Sodium, Na	•	
Chlorobenzene	Q	QN	Detection limit factor:	-	-
1,2-Dichlorobenzene	QN !	QN	Analysis date (ICP):	01/20/87	01/21/87
1,3-Dichlorobenzene			Analysis date (K):	01/19/87	01/19/87
1,4-Dichlorobenzene Ethvibenzene					
Toluene		7.5			
Total Aylenes	0.6	0.0			
Detection limit factor: Surrogate Recovery, %	74	1 93	<ul> <li>Data for nitrate/nitrite invalid, holding time exceeded</li> </ul>	invalid,	
			)		
Analysis Date:	11/14/86	12/23/86			

Groundwater sampling results for Well MAFB-69 at Mather AFB, California - ACW DISPOSAL SITE N-38. TABLE

	Round 1 11/13/86 765	Round 2 12/13/86 654		Round 1 11/13/86 765	Round 2 12/13/86 654
601 Results (ug/1)	1. 计划 性 精 化 化 化 化 化 化 化 化 化 化 化 化 化 化 化 化 化 化	1	Alkalinity Results (mg/l)		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Chloromethane	Q	QN	Bicarbonate Alk., as CaC03	09	51
Bromomethane Dichlorodifluoromethane			Carbonate Alk., as CaCO3 Hydroxide Alk., as CaCO3	4 QN	Q Q Q
Vinyl chloride	2	<b>Q S</b>	Annual and Annual	20,10,11	20.00
Methylene chloride	1.1 a	1.0 a	מושד לפרם משכם י	90/17/11	98//1/71
<pre>Trichlorofluoromethane 1,1-Dichloroethene</pre>	<b>Q Q</b>	C C C	429 Results (#g/l)		
1,1-Dichloroethane	2	2 1		Í	•
trans-1,2-Dichloroethene			Browlide Chlorade	ON C	<del>4</del> .0
1,2-Dichloroethane	S S		Fluoride	6.4 0.2	4.7
1,1,1-Trichloroethane	Q	QN	8	4.0	₩ 4.0
Carbon tetrachloride	Q.	2 !	2	Q.	₩
Bromodichloromethane	O W		Phosphate, as P Sulfate	ON G	ON 4
trans-1,3-Dichloropene	2	Î.			2
Trichloroethene	2	2	Detection limit factor:	7	
Dibromochloromethane			Analysis date:	11/14/86	12/16/86
cis-1,3-Dichloropropene	<u> </u>	2			
2-Chloroethylvinyl ether	2 9	29	Total Dissolved Solids (mg/l)	/1) 120	110
1.1.2.2-Tetrachloroethane	€ €	Q N	Detection Limit Factor:		-
Tetrachloroethene				11/14/86	12/15/86
Chlorobenzene Dichlorobenzenes	2 2				
			Mineral Results (mg/l)		
Detection limit factor: Surrogate Recovery &	106	57	Calcium, Ca		01
	11/17/86	12/19/86	Iron, Fe	0.31	0.079
			Magnesium, Mg	2.2	2.9
8020 Desigts (113/1)			nanganese, m Potassium, K	N _	
14.55. 011509V 0700				12	11
Benzene	<u> </u>	2 9	Detertion 14mit 6mm	-	-
Chiorobenzene 1.2-Dichlorobenzene	Q Z	2 2	Analysis date(ICP):	1/20/87	1/21/87
1,3-Dichlorobenzene	Q	ΩN	Analysis date(K):	1/19/87	1/19/87
1,4-Dichlorobenzene	2	2			
Ethylbenzene Toluene					
Total Xylenes	QN	QN			
limit fact	7	- (	Data for nitrate/nitrite invalid,	rite invalid,	
Surrogate Recovery, %	901	- - -	holding time exceeded	led	
Analvaja Date:	11/17/86	12/19/86			
		1			

Groundwater sampling results for Well MAFB-70 at Mather AFB, California - ACW DISPOSAL SITH N-39. TABLE

	Round 1 11/1   1/86 753	Round 2 12/12/86 643		Round 1 11/18/86 753	Round 2 12/12/16 643
601 Results (ug/l)	11 11 11 11 11 11 11 11 11 11 11 11 11	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Alkalinity Results (mg/l)		
Chloromethane Bromomethane Dishlorodiffloromethane	QN	QNN	Bicarbonate Alk., as CaCO3 Carbonate Alk., as CaCO3	8 9 ND	89 0N
Virgi Chloride Chloroethane Methylene chloride	ON ON I		Analysis date:	ND 11/21/86	ND 12/17/86
Trichlorof lucromethane 1, 1-Dichloroethene			429 Results (mg/1)		
1,1-Dichiorocchane trans-1,2-Dichlorocthene Chloroform	222		Browide Chloride	2.°°	1.2
1,2-Dichloroethane 1,1,1-Trichloroethane	QN	QN	•	0.2	7 A CZ
Carbon tetrachloride Bromodichloromethane	<u>Q</u> Q i	<b>88</b>	Nitrite, as N Phosphate, as P	QW QW	CIN
1,2-Dichloropropane 1,2-Dichloropropene Trichloroethene Dibromochloromethane			Sulfate Detection limit factor: Analysis date:	1.7 1 11/12/86	2.3 1 12/14/86
1,1,2-Trichloroethane cis-1,3-Dichloropropene 2-Chloroethylvinyl ether			Total Dissolved Solids(mg/l)	170	100
Bromoform 1,1,2,2 Tetrachloroethane Tetrachloroethane Chlorobenzene			Detection limit factor: Analysis started:	11/12/86	12/14/86
Dichlorobenzenes	QN	QIN	Mineral Results (mg/l)		
Detection limit factor: Surrogate Recovery, % Analysis Date:	1 62 11/14/86	1 49 12/18/86	Calcium, Ca Iron, Fe Magnesium, Mg	7.2 0.3 3.1	7.3 0.19 2.6
8020 Results (ug/l)			Manganese, Mn Potassium, K Sodium, Na	NI) 4 . 4 17	ND 5.4 20
Benzene Chlorobenzene 1,2-Dichlorobenzene 1,3-Dichlorobenzene 1,4-Dichlorobenzene Ethylbenzene Toluene Total Xylenes		22 ND ND 1.6 1.6 6.8	Detection limit factor: Analysis date (ICP): Analysis date (K):	1/20/87 1/19/87	1/21/87 1/19/87
Detection limit factor: Surrogate Recovery, %	1 62	53			
Analysis Date:	11/14/86	12/18/86			

Groundwater sampling results for Well MAFB-71 at Mather AFB, California - ACW DISPOSAL SITE N-40. TABLE

	Round 1 11/11/86 755	Round 2 12/12/86 646		Kound 1 11/11/86 755	Kound 2 12/12/86 646
601 Results (ug/l)	0 10 10 10 10 10 10 10 10 10 10 10 10 10	1	Alkalinity Results (mg/l)	1 9 9 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4
Chloromethane	QN.	CN	Bicarbonate Alk. as CaCo3	84	4.7
Bromomethane	QN	QN	Carbonate Alk., as CaCO3	2	Î
Dichlorodifluoromethane	2:	Q	Hydroxide Alk., as CaCO3	(IN	ND
Vinyi chioride			Ava Cects	20/16/11	,0,1,01
Methylene chloride	2	S	rietjoto dece.	90/17/11	99//1/71
Trichlorof luoromethane	2	Q.			
1,1-Dichloroethere	<b>3 5</b>	2 2	429 Results (Bg/l)		
trans-1,2-Dichloroethene	2	Q	Bromide	0.1	4.0
Chloroform	<b>Q</b>	Q.	Chloride	7.4	2.9
1,2-Dichloroethane		2		0.7	0.3
1,1,1-irichioroecoane Carbon tetrachloride		3 5	NILIBLE, BU N	0.2	
Bromodichloromethane	QN	Q	, a		0.5
1,2-Dichloropropane	ON:	QN	Sulfate	91	, , ,
trans-1,3-Dichloropropene			Detection 14mts factor.	-	•
Dibromochloromethane	2 2	Q Q	Analysis date:	11/12/86	12/14/86
1,1,2-Trichloroethane	QN	QN	•	i i	
cis-1,3-Dichloropropene	C S			-	•
Z-Unioroeunyivinyi ether Bromoform	2 2		iotal Dissolved Solids (mg/1)	001	<del>4.</del>
1,1,2,2-Tetrachloroethane	QN	CIN	Detection limit factor:	~	
Tetrachloroethene		QN S	Analysis started:	11/12/86	12/14/86
Chlorobenzene Dichlorobenzenes		ON ON			
	<u>.</u>	}	Mineral Results (mg/l)		
بد					
Surrogate Recovery, % Analysis Date:	96	102	Calcius, Ca	5.7	7.1
			ä	7.7	2.7
				CIN	ÎN.
8020 Results (ug/l)			Potassium, K	3.7	7.7
Benzene	CIN	QN		`1	1.1
Chlorobenzene	Q :	Q i	Detection limit factor:	-	~
1,2-Dichlorobenzene 1 3-Dichlorobenzene	2 2	<u> </u>	Analysis date (ICP):	1/20/87	1/21/87
1,4 - Dichlorobenzene	G.	QN ON	מופו ל פור ניין י	1713767	1713:87
Ethylbenzene	5.0	0.1			
ioluene Total Xylenes	23	0.4 0.4			
	-	_			
Surrogate Recovery, %	96 96	106			
	70/7 (/) [1	10.751.71			
Analysis Date:	11/1/100	30 (6.1 ) 71			

Groundwater sampling results for Well MAFB-72 at Mather AFB, California ACW DISPOSAL SITE TABLE N-41.

	Round 1 11/11/86 757	Round 2 12713786 650		Round 1 11/11/86 757	Round 2 12/13/86 650
601 Results (ug/1)	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1	Alkalinity Results (mg/l)	d	1
Chloromethane Bromomethane Dichlorodifluoromethane Vivul chloride		Q Q Q Q	Bicarbonate Alk., as CaCO3 Carbonate Alk., as CaCO3 Hydroxide Alk., as CaCO3	7.9 ND ND	60 16 NU
Chloroethane Methylene chloride	ON C	I OO	Analysis date:	11/21/86	12/17/86
Trichlorofluoromethane 1,1-Dichloroethene			429 Results (mg/l)		
1,1-Dichloroethane trans-1,2-Dichloroethene	QN X		Browide Chloride	0.1	9.0
Chloroform		(I)	Fluoride	0.08	o
l,z-bichloroethane l,l,l-Trichloroethane		O CN	Nitrate, as N	0.2	* CIN
Carbon tetrachloride	Q.	(IN	Phosphate, as P	CIN CIN	₩ CIN
bromodichloromethane 1,2-Dichloropropane		ON CIN	Sulfate	97	CIN S
trans-1,3-Dichloropropene Trichloroethene Dibromorhloromethene	G N N	ON N	Detection limit factor: Analysis date:	1 11/12/86	12/16/86
1,1,2-Trichlorethane		9	Total Dissolved Solids (mg/l)	200	120
Chloroethylvinyl ether		2	Metertion limit factor: Analysis started:	1 11/12/86	1 12/15/86
Tetracion Tetracione	QN Q	Q Q	Mineral Results (mg/l)		
Jetrachioroethene Chlorobenzene	ON O	Q Q	Calcium, Ca	9.6	~
Dichiorobenzenes	(I <b>N</b>	QN.	Iron, Fe Magnestia Mg	0.15	960.0
Detection limit factor: Surrogate Recovery, % Analysis Date:	1 76 11/14/86	106 106 12/19/86		1.2 ND 2.3	0,72 ND 4.2
8020 Results (1147)				4	27
Benzene Chlorobenzene	QN QN	ON CIN	Detection iimit factor: Analysis date (ICP): Analysis date (K):	1 1720787 1719787	1 1721787 1719787
1,3 Dichlorobenzene 1,3 Dichlorobenzene 1,4 Dichlorobenzene Ethylbenzene Toluene Total Xylenes			♣ Data for nitrate/nitrite invalid, holding time exceeded	e invalid,	
Detection limit factor: Surrogate Recovery, % Analysis Date:	1 26 11714786	101 101 101 101			

Groundwater sampling results for Well MAFB-73 at Mather AFB, California - ACW DISPOSAL SITE N-42. TABLE

	Round 1 11/15/86 780	Round 2 12/10/86 619		Round 1 11/15/86 780	Round 2 12/10/86 619
601 Results (ug/l)	, et et et et et et et et et et et et et	1	Alkalinity Results (mg/l)	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
Chloromethane	QN	CIN	Bicarbonate Alk., as CaCO3	001	60
Browomethane	Q.	Q	Carbonate Alk., as CaCO3	CIN S	ON S
Dichlorodifiuoromethane Vinvi chloride		S S	Hydroxide Alk., as CaCO3	(IN	Ž
Chloroethane	QN .	<u>R</u>	Analysis date:	11/21/86	12/16/86
Methylene chioride Trichlorofluoromethane	B Q N	28	429 Results (mg/l)		
1,1-Dichloroethene		3 2	-		1
l,I-Dichloroethane trans-l.2-Dichloroethene		Q Q	Browlde	NI)	ND 5.2
Chloroform	QN	QN	Fluoride	0.2	2.0
1,2-Dichloroethane	QN.	2		9.0	2.3
1,1,1-Trichloroethane			Nitrite, as N		ON N
Carbon tetrachioride Bromodichioromethane			gulfate	ND 12	1.7
1,2-Dichloropropane	QN	Q	1	1	•
trans-1,3-Dichloropropene	2	<b>Q</b>	Detection limit factor:	1	
Trichlorethene Dibromochloromethene			Analysis date:	11/1/186	12/11/86
1,1,2-Trichloroethane	Q.	QN	Total Dissolved Solids (mg/l)	84	16.00
cis-1,3-Dichloropropene	QN	ON A		-	-
Chioroetnylvinyl ether Bromoform	E S	QN	Analysis started:	11/17/86	12/12/86
1,1,2,2-Tetrachloroethane	QN	(IN			
Tetrachloroethene			Mineral Results (mg/1)		
uniorobenzene Dichlorobenzenes	Q Q	QN QN	Calctum, Ca	9.1	8
				0.045	0.26
Detection limit factor:	1 6	107	Magnesium, Mg Manaenese, Mn	4.3 0.006	4.4
	11/19/86	12/12/86		4.1	0.76
8020 Results (ug/l)			SOL CHOILD	: -	87
	2	Civ	Detection limit factor:	1	
Denzene (Tb.) orobenzene	î Z		Analysis date (ICF): Analysis date (K):	1719787	1/19/8/
Circle Openizene	C N	<b>Q</b>	nialysis date (n):		
1,3 Dichlorobenzene	QN	QN			
1,4 Dichlorobenzene	a R	<u> </u>			
Ethylbenzene Toluene	Q QN	G Z			
Total Xylenes	NID	CIN			
نب					
Surrogate Recovery, * Analysis Date:	38761711 76	107			

Groundwater sampling results for Well MAFB-75 at Mather AFB, California - N.E. PERIMETER TABLE N-43.

A TO Deall to Control	Round 1 11/15/86 778	Round 2 12/10/86 617		Round 1 11/15/86 776	Round 2 12/10/86 617
or results (44.1)			Alkalinity Results (ug/l)		
Chloromethane Bromomethane Dichlorodifiloromethane	O C C C		Bicarbonate Alk., as CaC03 Carbonate Alk., as CaC03 Hydroxide Alk., as CaC03	62 ND ND	7.7 UND ND
Chloroethane Hethylene chloride Trichlorofluoromethane	ND 7.5 a	OND O. 6 a	Analysis date:	11/21/86	12/16/86
<pre>1,1-Dichloroethene 1,1-Dichloroethane trans-1,2-Dichloroethene</pre>			Browlde	0.1	QN.
Chlorofor: 1,2-Dichloroethane 1,1,1-Trichloroethane	S S S	Q Q Q	Fluoride Nitrate, as N Nitrite, as N	4.5 0.1 2.6 ND	6.4 ON 2.8
Carbon tetrachloride Bromodichloromethane 1.2-Dichloromethane	ON SO	<u> </u>	Phosphate, as P Sulfate	ND 6.8	5.8
trans-1,3-Dichloropropene Trichloroethene Dibromochloromethane		G Q S	Detection limit factor: Analysis date:	11/17/86	12/11/86
1,1,2-Trichloroethane cis-1,3-Otchloropropene		O S	Total Dissolved Solids (mg/l)	120	130
Chloroethylvinyl ether Bromoform	225		Detection limit factor: Analysis started:	1 11/17/86	12/11/86
		0.0 0.0 ND	Mineral Results (mg/1)		
Dichlorobenzenes	QN	ND	Calcium, Ca Iron Fe	11	112
Detection limit factor: Surrogate Recovery, & Analysis Date:	1 101 11/19/86	1 93 12/12/86	Magnesium, Mg Manganese, Mn Potassium, K Sodium, Na	0.05 0.05 0.05 0.05	0.078 6.4 0.024 1.4
8020 Results (ug/l)					0
Benzene Chlorobenzene 1,2-Dichlorobenzene 1,4-Dichlorobenzene 1,4-Dichlorobenzene Ethylbenzene Toluene			Detection limit factor: Analysis date (ICP): Analysis date (K):	1/20/87 1/19/87	1 1/21/87 1/19/87
Detection limit factor: Surrogate Recovery, % Analysis Date:	1 101 11/19/86	1 105 12/17/86			

Groundwater sampling results for Well MAFB-76 at Mather AFB, California - N.E. PERIMETER N-44. TABLE

	Round 1 11/14/86 776	Round 2 12/10/86 616		Round 1 11/14/86 776	Round 2 12/10/86 616
6 4 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	66 14 15 16 16 16 16 16 16 16 16 16 16 16 16 16	# # # # # # # # # # # # # # # # # # #		0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	11 11 11 11 11 11 11 11 11 11 11 11 11
60l Results (ug/l)			Alkalinity Results (ug/l)		
Chloromethane Bromomethane Dichlorodifluoromethane	QQQ	QN QN QN QN	Bicarbonate Alk., as CaC03 Carbonate Alk., as CaC03 Hydroxide Alk., as CaC03	9 <b>4</b> 9 UD	4 8 ND
Vinyl chloride Chloroethane Methylene chloride	ND ND	ON S		11/21/86	nD 12/16/86
Trichlorofluoromethane 1.1-Dichloroethene	d CN		429 Results (mg/l)		
1,1-Dichloroethane trans-1,2-Dichloroethene			Browlde	0.2	0.2
Chloroform	2	2		0.1	1.1 ND
1,1-Juntologuane	3.3 q	ON ON	Nitrate, as N Nitrite, as N	3.5 ND	3.5 <b>N</b> D
Carbon tetrachloride Bromodichloromethane	Q QN	ON ON	•	ON E	ND C
1,2-Dichloropropane trans-1,3-Dichloropropene Trichloroethene	<b>22</b>	<b>999</b>	Detection limit factor:		
Dibromochloromethane	22	22	Analysis date:	11/16/86	12/11/86
1,1,2-Trichloroethane cis-1,3-Dichloropropene Chloroethylvinyl ether	Ö Ö Ö Ö	Q Q Q	Total Dissolved Solids (mg/l) Detection limit factor: Analysis started:	180 1 11/15/86	130 1 12/11/86
Tetrachloroethane Tetrachloroethane		ON ON	Mineral Results (mg/l)		
Chlorobenzene Dichlorobenzenes		g q q		13	12 0.042
Detection limit factor: Surrogate Recovery, % Analysis Date:	1 79 11/19/86	1 96 12/12/86	Magnesium, Mg Manganese, Mn Potasium, K Sodium, Na	6.5 0.05 0.96	6.4 0.012 0.76
8020 Results (ug/1)			Detection limit factor:	` ~	\. 0
Benzene Chlorobenzene 1,2-Dichlorobenzene 1,3-Dichlorobenzene 1,4-Dichlorobenzene Ethylbenzene Toluene			Analysis date (ICP): Analysis date (K):	1/20/87 1/19/87	1/21/87 1/19/87
Detection limit factor: Surrogate Recovery, % Analysis Date:	1 79 11/19/86	1 96 12/12/86			

TABLE N-45. Groundwater sampling results for Well AC-01 at Mather AFB, California Base Production

	Round 1	Round 2	Round	1 1 Round 2	2
	NOT TAKEN	647	NOT TAKEN		9
		;			
601 Results (ug/l)	经转移 经存货 医甲状腺 医甲状腺 医甲状腺 医甲状腺 医甲状腺 医甲状腺 医甲状腺 医甲状腺	17 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Alkalinity Results (mg/1)	й п ч и и п п п п и и и и и и и и и и и и	11 11 11 11 11 11 11 11 11 11
Chloromethane		22	Bicarbonate Alk., as CaCO3 Carbonate Alk as CaCO3	49 UN	
Dichlorodifluoromethane		2	9 45	Z	
Chloroethane Methylene chloride		229	Analysis date:	12/17/86	
Trichlorof luoromethane 1,1-Dichloroethene		999	429 Results (mg/l)		
trans-1,2-Dichloroethene		2	Browide	ND .	0 -
1,2-Dichloroethane	C	2		0.0	- 01
l,l,l-Trichloroethane Carbon tetrachloride	Pnly	28	Nitrate, as N Nitrite, as N	. t	~ ~
Brogodichloromethane 1,2-Dichloropropane	y on	22	e, a	UN 4.5	
trans-1,3-Dichloropropene Trichloroethene	e si	1.8	Detection limit factor:		
Dibromochloromethane 1,1,2-Trichloroethane	amp	<b>2</b> 29	Analysis date:	12/14/86	
<pre>2 cls-1,3-Dichloropropene &gt; 2-Chloroethylvinyl ether A Bromoform</pre>	le a	225	Total Dissolved Solids (mg/1)	110	
	iutho	99	Detection limit factor: Analysis started:	12/14/86	
Chlorobenzene Dichlorobenzenes	priz	<b>2</b> 2			
Detection limit factor.	æ d	-	Mineral Results (mg/l)		
Surrogate Recovery, &	fo	102	Calcium, Ca	.6	
Analysis Date:	rp	98/61/71	iron, re Magnesium, Mg	0 . 14 4 . 1	_
8020 Been   Fe (1947) 1	ro		Manganese, Mn	Z	
	duc	į		7.6	
Benzene Chlorobenzene	cti o	229	-		
1,4-Dichlorobenzene 1,3-Dichlorobenzene	n v	22	Analysis date (ICP): Analysis date (K):	1/21/87	
1,4-Dichlorobenzene Ethylbenzene	vell	<b>2</b> 2			
Toluene Total Xylenes	ls	<b>99</b>			
Detection limit factor:		103			
surrogate Recovery, 4					
Analysis Date:		12/19/86			

Groundwater sampling results for Base Well HW-01 at Mather AFB, California Base Production N-46. TABLE

. 2	Round 1	Round 2 12/10/86 628	Round 1 NOT TAKEN	Round 2 12/10/86 628
601 Results (ug/1)	14 11 11 11 15 15 15 16 16 16 17 11 11 11 11	H H H H H H H H H H H H H H H H H H H	Alkalinity Results (mg/l)	4 6 6 11 10 21 11 11 14 14 14 14 14 14
Chloromethane Bromomethane Dichlorodifluoromethane		<u> </u>	Bicarbonate Alk., as CaCO3 Carbonate Alk., as CaCO3 Hydroxide Alk., as CaCO3	ND ON
Vinyl chloride Chloroethane Methylene chloride			Analysis date:	12/17/86
Trichlorofluoromethane 1,1-Dichloroethene		<u>e</u> e e	429 Results (mg/l)	
1,1-Dichlor octions trans-1,2-Dichloroethene	C		Bromide Chloride	ND 4.1
1,2-Dichloroethane	)nl			
1,1,1-Trichloroethane Carbon tetrachloride	ус		nicace, as n Nitrite, as N	
Bromodichloromethane	ne		Phosphate, as P Sulfate	<u> </u>
trans-1,3-Dichloropropene Trichloroethene Dibromochloromethane	sample		Detection limit factor: Analysis date:	1 12/11/86
cis-1,3-Dichloropropene Chloroethylvinyl ether	e au		Total Dissolved Solids (mg/1)	180
Browoform 1,1,2,2-Tetrachloroethane Tetrachloroethene Chlorobenzene	thorize	9999!	Detection Limit factor: Analysis started:	112/11/86
Dichlorobenzenes	ed :		Mineral Results (mg/1)	
Detection limit factor: Surrogate Recovery, % Analysis Date:	for prod	1 147 12/15/86	Calcium, Ca Iron, Fe Magnesium, Mg	18 9.3 8.4.4
8020 Results (ug/l)	duc ti		Potassium, K Sodium, Na	3.4
Benzene Chlorobenzene	on		_	I
1,2-Dichlorobenzene 1,3-Dichlorobenzene 1,4-Dichlorobenzene Ethylbenzene Toluene Total Kylenes	wells	999999	Analysis date (ICP): Analysis date (K):	1/21/87
Detection limit factor: Surrogate Recovery, %		1 147		
Analysis Date:		12/15/86		

Groundwater sampling results for Well HW-03 at Mather AFB, California Base Production TABLE

		Round 1	Round 2 12/10/86	Kound 1		Round 2
		NOT TAKEN	624	NOT TAKEN	KEN	624
		11 19 16 16 16 18 18 18 18 18 18	97 40 44 55 111 111 111 111 111 111	1	0 0 0 0 0 4 -1 -1 0 9	4 4 4 8 1 1 1 1 1 1 4 4 4 4 4 4 4 4 4 4
	601 Results (ug/l)			Alkalinity Results (mg/1)		
	Chloromethane Bromomethane Dichlorodifluoromethane		Q Q Q	Bicarbonate Alk., as CaCO3 Carbonate Alk., as CaCO3 Hydroxide Alk., as CaCO3		110 ND ND
	Vinyl chloride Chloroethane		<b>99</b> 9			12/17/86
	Trichlorofluoromethane	0	229	429 Results (mg/l)		
	1,1-Dichloroethene 1,1-Dichloroethene trans-1,2-Dichloroethene	nly (	222	Bromide Chloride		ND 6.7
	Chloroform 1,2-Dichloroethane	one	<u>Q</u> Q	8		ON ON
N	1,1,1-Trichloroethane Carbon tetrachloride Bromodichloromethane	samp	<b>222</b> !	Nitrite, as N Phosphate, as P Sulfate		N N N O
<b>-</b> 47	1,2-Dichloropropane trans-1,3-Dichloropropene Trichloroethene Dibromochloromethane	le autl	<b>222</b> 9	Detection limit factor: Analysis date:		1 12/11/86
	1,1,2-Trichloroethane cis-1,3-Dichloropropane	hori	229	Total Dissolved Solids (mg/l)		180
	Chickochyiviny cher Comoform 1,1,2,2-Tetrachloroethane Tetrachloroethene	zed fo		Detection limit factor: Analysis started:		1 12/11/86
	Chlorobenzene Dichlorobenzenes	r pr	ON O	Mineral Results (mg/l)		
	Detection limit factor: Surogate Recovery, & Analysis Date: 8020 Results (ug/l)	oduction w	1 83 12/12/86	Calcium, Ca Iron, Fe Magnesium, Mg Manganese, Mn Potassium, K Sodium, Na		20 0.35 9.8 0.16 3.8
	Benzene Chlorobenzene 1,2-Dichlorobenzene 1,3-Dichlorobenzene 1,4-Dichlorobenzene Ethylbenzene Toluene Total Xylenes	vells		Detection limit factor: Analysis date (ICP): Analysis date (K):		1/21/87 1/19/87
	Detection limit factor: Surrogate Recovery, % Analysis Date:		1 83 12/12/86			

TABLE N-48. Groundwater sampling results for Well HW-04 at Mather AFB, California Base Production

1	Round 1	Round 2 12/10/86 621	Round 1	Round 2 12/10/86 N 621	
601 Results (ug/1)	1) 11 12 13 14 14 14 14 14 14 14 14 14 14 14 14 14	9 9 9 10 11 14 15 10 9 9 9 14 14 14 14 14 14 14 14 14 14 14 14 14	Alkalinity Results (mg/l)	0	4
Chloromethane Bromomethane Dischlorods [luromethane			Bicarbonate Alk., as CaCO3 Carbonate Alk., as CaCO3 Hydroxide Alk., as CaCO3	38 ND UD	
viny, thioline Chloroethane Methylene chloride Trichlorofluoromethane		2002	Analysis date: 429 Results (mg/l)	12/17/86	
1,1-Dichloroethene 1,1-Dichloroethane trans-1,2-Dichloroethene Chloroform 1,2-Dichloroethane	Only		Bromide Chloride Fluoride Nitrate, as N	MD 8.1 ND ND	
1,1,1 Trichloroethane Carbon tetrachloride Bromodichloromethane 1,2-Dichloropeopane	y one :	<u> </u>	Nitrite, as N Phosphate, as P Sulfate	ON N	
trans-1,3-Dichloropropene Trichloroethene Obromochloromethane	sam p	222	Detection limit factor: Analysis date:	12/11/86	
1,1,2-Trichloroethane	ole i	225	Total Dissolved Solids (mg/l)	150	
Chloroethylvinyl ether Bromoform Tetrachloroethane	autho		Detection limit factor: Analysis started:	112/11/86	
Tetrachloroethene Chlorobenzene	oriz	229	Mineral Results (mg/l)		
Dichlorobenzenes	ed f	2 <b>2</b>	Calcium, Ca Iron, Fe	13	
Detection limit factor: Surrogate Recovery, % Analysis Date:	or prod	1 130 12/12/86	Magnesius, Mg Manganese, Mn Potassius, K Sodius, Na	6.1 0.13 2.9 9.2	
8020 Results (ug/l) Benzene Chlorobenzene l, 2. Dichlorobenzene l, 4. Dichlorobenzene Ethylbenzene Toluene Toluene	duction wells		Detection limit factor: Analysis date (ICP): Analysis date (K):	1/21/87 1/19/87	
Detection limit factor: Surrogate Recovery, \$ Analysis Date:		1 130 12/12/186			

TABLE N-49. Groundwater sampling results for Well HW-05 at Mather AFB, California Base Production

	Round 1	Round 2 12/10/86 626		Round 1	Round 2 12/10/86 626
601 Results (ug/1)	0 11 14 10 10 11 11 11 11 11 11	1 0 1 1 1 1 1 1 1 1 1 1 1 1	Alkalinity Results (mg/l)	1	, 1 1 0 0 1 0 4 4 5 1 4
Chloromethane		QN			78
Bromomethane Dickierodificoromethese		2 2	Carbonate Alk., as CaCO3		2
Vinyl chloride		2			2
Chloroethane Methelene chloride		2	Analysis date:		12/17/86
Trichlorofluoromethane		Q S	429 Results (mg/l)		
1,1-Dichloroethene		2 2			•
1,1-Dichiorograms trans-1,2-Dichloroethene	0	2	Chloride		NI)
Chloroform	h	Q	Fluoride		QN
1,2-Dichloroethane	y	Q	Nitrate, as N		CIN
1,1,1-Trichloroethane	01	<b>Q</b>	z		CN.
Carbon tetrachloride	ne		Phosphate, as P		2
Bromodichloromethane	Si	2 2	Sulfate		
1,2-Dichioropropene trans-1,3-Dichloropropene	am	2 2	Detection limit factor:		-
Trichloroethene	ı pl	2			12/11/86
Dibromochloromethane	e		((/ www. and (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. post (app. pos		031
1,1,2-Trichloroechane cia-l 3-Dichloroechane	au				061
Chloroethylvinyl ether	ith	Q	Detection limit factor:		
Bronoform	юг	<u>Q</u> :	Analysis started:		12/11/86
l, l, 2, 2-Tetrachloroethane Tetrachloroethane	iz	2	Minore Desuits (86/1)		
Chlorobenzene	e	2	יייייי פון אניייייייייייייייייייייייייייייייייייי		
Dichlorobenzenes	i f	Q.	Calcium, Ca		12
	or	•			0.052
	F	<b>→</b> 10	Magnesium, Mg		<b>4.</b> 9
Surrogate Recovery, *	<b>)</b> T(	60, 51, 51			0.081
Analysis Date:	odı	12/13/86	Potassium, K Sodium, Na		13
8020 Results (ug/l)	ıct				•
	io	Ę	Detection limit ractor: Analysis data (ICD):		1 / 2 / 1 / 6 / 1
Chlorobenzene	n	€ ⊊			1/19/87
1,2-Dichlorobenzene	w	Q			
1,3-Dichlorobenzene	eli	CN			
1,4 Dichlorobenzene	ls	Q S			
Ethylbenzene Tolioge					
Total Xylenes		QW QW			
ىد		7			
Surrogate Recovery, * Analysis Date:		85 12/13/86			

TABLE N-50. Groundwater sampling results for Well HW-06 at Mather AFB, California Base Production

	Round 1 NOT TAKEN	Round 2 12/10/86 627		Round 1	Round 2 12/10/86 627
601 Results (ug/l)	대 대 대 대 대 대 대 대 대 대 대 대 대 대 대 대 대 대 대	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Alkalinity Results (mg/l)	91 11 12 11 14 14 11 11 11 14	11 -1 -5 
Chloromethane Bromomethane Dichlorodifluoromethane Viny chloride		<u> </u>	Bicarbonate Alk., as CaCO3 Carbonate Alk., as CaCO3 Hydroxide Alk., as CaCO3		6.8 Nr) ND
Chloroethane Methylene chloride Trichlorofluoromethane	Or		Detection limit factor: Analysis date:		12/17/86
1,1-DCA	dy		429 Results (mg/l)		
trans-1,2-DCE Chloroform 1,2-DCA	one :	<u>e e e</u>	Browide Chloride Flooride		ON E.3
1,1,1-TCA Carbon tetrachloride	sam	99			0.6
Bromodichloromethane 1,2-Dichloropropane trans-1,3-Dichloropropane	iple a	9 <b>9</b> 9	n 6		0 . 6
TCE Dibromochloromethane a 1,1,2-Trichloroethane a	authori		Detection limit factor: Analysis date:		12/11/86
nyl ether	zed for	22229	Total Dissolved Solids (mg/l) Detection limit factor: Analysis date:		130 1 12/11/86
Chlorobenzene Dichlorobenzenes	pro	Q Q	Mineral Results (mg/l)		
Detection limit factor: Surrogate Recovery, % Analysis Date:	duction	1 91 12/13/86	Calcium, Ca Iron, Fe Magnesium, Mg Manganese, Mn		12 0.086 5.8 0.12
8020 Results (ug/l) Benzene	we!	<b>S</b>			2.3
Chlorobenzene 1,2-Dichlorobenzene 1,3-Dichlorobenzene 1,4-Dichlorobenzene Ethylbenzene Toluene	lis		Detection limit factor: Analysis date (ICP): Analysis date (K):		1/21/87 1/19/87
Detection limit factor: Surrogate Recovery, % Analysis Date:		1 91 12/13/86			

TABLE N-51. Groundwater sampling results for Well JT-01 at Mather AFB, California Base Production

	Round 1 NOT TAKEN	Round 2 12/12/86 648	Rou	Round 1	Round 2 12/12/86 648
601 Results (ug/1)	1) 11 12 13 16 18 18 18 18 18 18 18 18 18 18 18 18 18	81 - 7 - 4 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0	Alkalinity Results (mg/l)	1 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	0 -1 -3 -1 -3 -4 -3 -4 -4 -4 -4 -4 -4 -4 -4 -4 -4 -4 -4 -4
Chloromethane Bromomethane Dichlorodifluoromethane		CN O	Bicarbonate Alk., as CaCO3 Carbonate Alk., as CaCO3 Hydroxide Alk., as CaCO3		140 ND ND
vinyl chloride Chloroethane Methylene chloride Trichlorofluoromethane 1,1-Dichloroethene	O	NN CD . I A DO ND CN	Detection limit factor: Analysis date:	٦	2/17/86
1,1-Dichloroethane trans-1,2-Dichloroethene	nl y	S S	429 Results (mg/l)		
Chloroform 1,2-Dichloroethane	one	Q Q	Bromide Chloride		ND 16
1,1,1-Trichloroethane Carbon tetrachloride	: sa	ON ON	8		ND 5.4
Bromodichloromethane 1,2-Dichloropropane trans-1,3-Dichloropropene	mple	7.0 QN QN	Nitrite, as N Phosphate, as P Sulfate		ND 10
1/1/1/1/1/1/1/1/1/1/1/1/1/1/1/1/1/1/1/	author	G C ON C	Detection limit factor: Analysis date:	1	12/14/86
Entorogeny Total Coner Bromoform	ize	2°.0	Total Dissolved Solids (mg/l)		250
1,1,2,2 Tettachloroethane Tetrachloroethene Chlorobenzene Dichlorobenzenes	d for p	2222	Detection limit factor: Analysis started:	•	1 12/14/86
Detection limit factor: Surrogate Recovery, %	rodi	121	Mineral Results (mg/l)		
	ucti	12/23/86	Calcium, Ca Iron, Fe		34
8020 Results (ug/l)	on.		Magnesium, Mg Mangangae, Mp		91
Benzene Chlorobenzene	well	SNS			1.6 15
1, 2 - Dichlor Oberizene 1, 3 - Dichlorobenzene 1, 4 - Dichlorobenzene Ethylbenzene Toluene Total Xylenes	S		Detection limit factor: Analysis date (ICP): Anlysis date (K):		1 1/21/87 1/19/87
Detection limit factor: Surrogate Recovery, % Analysis Date:		1 102 12/23/86			

TABLE N-52. Groundwater sampling results for Well K-9 at Mather AFB, California Base Production

12/1		Round 1	Round 2 12/10/86	Kou	Kound 1	Round 2 12/10/86 623
Alkalinity Results (mg/l)  ND Bicarbonate Alk., as CaCOJ  ND ND Hydroxide Alk., as CaCOJ  ND Analysis date:  ND Analysis date:  ND Analysis date:  ND Hydroxide Alk., as CaCOJ  ND Analysis date:  ND Analysis date:  ND Chloride  ND Hydroxide Alk., as CaCOJ  ND Analysis date:  ND Chloride  ND Hydroxide Alk., as CaCOJ  ND Hydroxide Alk., as CaCOJ  ND Hydroxide Alk., as CaCOJ  ND Hydroxide Alk., as CaCOJ  ND Hydroxide Alk., as CaCOJ  ND Hydroxide Alk., as CaCOJ  ND Hydroxide Alk., as CaCOJ  ND Hydroxide Alk., as CaCOJ  ND Hydroxide Alk., as CaCOJ  ND Hydroxide Alk., as CaCOJ  ND Hydroxide Alk., as CaCOJ  ND Hydroxide Alk., as CaCOJ  ND Hydroxide Alk., as CaCOJ  ND Hydroxide Alk., as CaCOJ  ND Hydroxide Alk., as CaCOJ  ND Hydroxide Alk., as CaCOJ  ND Hydroxide Alk., as CaCOJ  ND Hydroxide Alk., as CaCOJ  Aralysis date:  ND Hydroxide Alk., as CaCOJ  ND Hydroxide Alk., as CaCOJ  Aralysis date (K):  ND Hydroxide Alk., as CaCOJ  ND Hydroxide Alk., as CaCOJ  ND Hydroxide Alk., as CaCOJ  Aralysis date (K):  ND Hydroxide Alk., as CaCOJ  ND Hydroxide Alk., as CaCOJ  Aralysis date (K):  ND Hydroxide Alk., as CaCOJ  ND Hydroxide Alk., as CaCOJ  Aralysis date (K):  ND Hydroxide Alk., as CaCOJ  ND Hydroxide Alk., as CaCOJ  Aralysis date (K):  ND Hydroxide Alk., as CaCOJ  ND Hydroxide Alk., as CaCOJ  Aralysis date (K):  ND Hydroxide Alk., as CaCOJ  ND Hydroxide Alk., as CaCOJ  Aralysis date (K):  ND Hydroxide Alk., as CaCOJ  Aralysis date (K):  ND Hydroxide Alk., as CaCOJ  Aralysis date (K):  ND Hydroxide Alk., as CaCOJ  Aralysis date (K):  ND Hydroxide Alk., as CaCOJ  Aralysis date (K):  ND Hydroxide Alk., as CaCOJ  Aralysis date (K):  ND Hydroxide Alk., as CaCOJ  Aralysis date (K):  ND Hydroxide Alk., as CaCOJ  Aralysis date (K):  ND Hydroxide Alk., as CaCOJ  Aralysis date (K):  ND Hydroxide Alk., as CaCOJ  Aralysis date (K):  ND Hydroxide Alk., as CaCOJ  Aralysis date (K):  ND Hydroxide Alk., as CaCOJ  Aralysis date (K):  ND Hydroxide Alk., as CaCOJ  Aralysis date (K):  ND Hydroxide Alk., as CaCOJ  Aralysis date (K):  ND Hydro		NOT TAKEN	623	JON	TAKEN	6.20
Alkalinity Results (m)  Bicarbonate Alk., as Cacc ND ND ND Analysis date:  ND Analysis date:  ND Analysis date:  ND Analysis date:  ND Analysis date:  ND Analysis date:  ND Analysis date:  ND Analysis date:  ND Analysis date:  ND Analysis date:  ND Analysis date:  ND Analysis date:  ND Analysis date:  ND Analysis date:  ND Analysis date:  ND Analysis date:  ND Analysis date:  ND Analysis date:  ND Analysis date:  ND Analysis date:  ND Analysis date:  ND Analysis date:  ND Analysis date:  ND Analysis date:  ND Analysis date:  ND Analysis date:  ND Analysis date:  ND Analysis date:  ND Analysis date:  ND Analysis date:  ND Analysis date:  ND ND ND ND ND ND ND ND ND ND ND ND ND	# # #	11 11 12 13 14 14 14 14 14 14 14 14 14 14 14 14 14	11 11 14 15	1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1	d d d d d d d d d d d d d d d d d d d	1 0 0 1 4 
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oduction wells	Chlorobenzene	pr	<b>2</b>			
108 108 108 12/12/46 ND ND	Ulchloropenzenes	.04	1	Calcium, Ca		7 -
108 12/12/186 MU ON ON ON ON ON ON ON ON ON ON	Detection limit factor:	du	7	Iron, Fe		5.1
12/12/86 ND ND ND ND ND ND ND ND ND ND ND ND ND N	Surrogate Recovery, %	C1	108			0.11
ts (ug/l)	Analysis Date:	tic	12/12/86			1.7
#/1)  self	•	'n				15
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tor: 12/12/186	Benzene	ell	QN	Detection limit factor:		1/21/87
tor: 12/12/86	Chlorobenzene	s	2 9	Analysis date (107):		1/19/87
tor:	1,2 Dichlorobenzene		2 5			
tor:	1,3-Dichlorobenzene		2 2			
s mit factor: covery, % e:	1,4-Dichlorobenzene		<u> </u>			
.or:	Ethy ibenzene Tolisene		QN			
or:	Total Xylenes		QN			
12/12			_			
	Surrogate Recovery, \$		108			
	Analysis Date:		00/71/71			

TABLE N-53. Groundwater sampling results for well MB-01 at Mather AFB, California Base Production

		Round 1	Round 2 12/10/86 622	Rourid 1		Round 2 12/10/86 622
	601 Results (ug/1)	ं । । । । । । । । । । । । । । । । । । ।		Alkalinity Results (mg/l)		
	Chloromethane Bromomethane Dichlorodifluoromethane			Bicarbonate Alk., as CaCO3 Carbonate Alk., as CaCO3 Hydroxide Alk., as CaCO3		411 ON ON
	Vinyl chloride Chloroethane Methylene chloride Trichlorofluoromethane	Only	29999	Analysis date:	12	12/17/86
	<pre>1,1-Dichloroethene 1,1-Dichloroethane trans-1,2-Dichloroethene Chloroform</pre>	one :	2005	4.29 Results (ug/1) Browlde (Thloride		ND 
	1,2-Dichloroethane 1,1,1-Trichloroethane Carbon tetrachloride	sam pl	999	22		ND 1.7 ND
N	Bromodichloromethane 1,2-Dichloropropene	e au	2 <b>2</b> 5	Phosphate, as P Sulfate		ND 1.9
-53	Trichloroethene Dibromochloromethane 1,1,2 Trichloroethane	thorize		Detection limit factor: Analysis date:	12	1 12/11/86
	Chloroethylvinyl ether	ed f	222	Total Dissolved Solids (mg/1)		81
	1,1,2,2.Tetrachloroethane Tetrachloroethene Chlorobenzene	or pro		Detection limit factor: Analysis date:	12	1 12/11/86
	Detection Nait factor:	duc	2	Mineral Results (mg/l)		
	Surrogate Recovery, % Analysis Date:	tion	89 12/12/86	Calcium, Ca Iron, Fe Magnestim, Mg		7.5 0.02 4
	8020 Results (ug/l) Benzene	wells	QN	Manganese, Mn Potassium, K Sodium, Na		ND 0.97 7.4
	Chlorobenzene 1,2 Dichlorobenzene 1,3 -Dichlorobenzene 1,4 Dichlorobenzene Ethylbenzene Toluene			Detection limit factor: Analysis date (ICP); Analysis date (K):		1 1/21/87 1/19/87
	Detection limit factor: Surrogate Recovery, & Analysis Date:		1 89 12/12/86			

Groundwater sampling results for Well MB-04 at Mather AFB, California Base Production N-54. TABLE

		Round 1	Round 2 12/10/86 625		Round 1	Round 2 12/10/86 625
	601 Results (ug/1)	1) 18 10 10 10 10 10 10 10 10 10 10 10 10 10	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Alkalinity Results (mg/l)	6 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	15 11 14 14 14 16 16 17
	Chloromethane Bromomethane Dichlorodifluoromethane		ONN	Bicarbonate Alk., as CaCO3 Carbonate Alk., as CaCO3 Hydroxide Alk. as CaCO3		4 N D
	Vinyl chloride Chloroethane Mathulane chloride			Analysis date:		ND 12/17/86
	Trichlorollucromethane 1,1-Dichlorothene	On		429 Results (mg/l)		
	trans-1,2-Dichloroethene	ly or	ON CO	Bromide Chloride		ND 2.5
	1,2-Dichloroethane 1,1,1-Trichloroethane	ne s		Fluoride Nitrate, as N		ND 1.3
	Carbon tertachlorine Browndichlorogethane 1, 2-Dichloropenpane 2, 2-Dichloropenpane	am pl		ສ . ສຸ		ND ND 1.5
N-54	2	e auth		Detection limit factor: Analysis date:		12/11/86
	Chloroethylvinyl ether Promoform	oriz	999	Total Dissolved Solids (mg/1)		120
	1,1,2,2-Tetrachloroethane 2 Tetrachloroethene 2 Chlorobenzene	ed for	2225	Detection limit factor: Analysis started:		1 12/11/86
		pro	) <i>'</i>	Mineral Results (mg/l)		
	Detection limit lactor: Surrogate Recovery, % Analysis Date:	oducti	78 78 12/13/86	Calcium, Ca Iron, Fe Magnesium, Mo		8.6 0.018
	8020 Results (ug/l) Benzene	ion we	QN	Manganese, Mn Potassium, K Sodium, Na		1.9 ND 1.9
	Chlorobenzene 1,2-Dichlorobenzene 1,3-Dichlorobenzene 1,4-Dichlorobenzene Ethylbenzene Toluene	elis	<b>22222</b> 22	Detection limit factor: Analysis date (ICP): Analysis date (K):		1/21/87 1/19/8/
	Detection limit factor: Surrogate Recovery, % Analysis Date:		1 78 12/13/86			

N-55. Method Detection Limits for Analytical Parameters TABLE

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Arachic, As  Mercury, Hg  0.5  Mikalinity hesuits (uq/1)  6.5  Mikalinity hesuits (uq/1)  6.5  Micarbonate Aik., as (ac03)  6.5  Micarbonate Aik., as (ac03)  6.5  Micarbonate Aik., as (ac03)  6.5  Micrate, as N  6.5  Mirrite, as N  6.6  Mirrite, as N  6.7  Mirrite, as N  6.8  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite, as N  6.9  Mirrite,	oromethane 0.5  oride 0.5  comethane 0.5  thane 0.5  thane 0.5  thane 0.5  ropane 0.5  rop	601 (ug/1)		Atomic Absorption Metal Resu	ults (ug/1)
Microsoft   Marcosoft   Marc	a a a a a a a a a a a a a a a a a a a	loromethane	. o c		•
Bicarbonate Alk., as (aC0)	2	chlorodifluoromethane		Mercury, Hg	0.2
State	2	nyl chloride	6.5	Selenium, Se	7
### Alkalinity Results (uq/l)  #### Bicarbonate Aik., as CaCO3  #### Carbonate Aik., as CaCO3  ##### Carbonate Aik., as CaCO3  ###################################	1)	oroethane  bv ene_ch oride			
### Bicarbonate Alk., as GaC03    10	1) Man Pene Pene Pene Pene Pene Pene Pene Pe	chlorof luoromethane	6.5	Alkalinity Results (ug/l)	
Pene 0.5 (arbinate Alix., as (a(0))  0.5 (arbinate Alix., as (a(0))  0.5 (arbinate Alix., as (a(0))  0.5 (arbinate Alix., as (a(0))  0.5 (arbinate Alix., as (a(0))  0.5 (arbinate, as Note of the original arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate, arbinate	1) Man en en en en en en en en en en en en en	Dichloroethene	ء د ب د		^
### ### ##############################	2	ns 1,2 Dichloroethene	0.5	Carbonate Alk., as CaCO3	4
## 429 Results (mg/l)  0.5  6.5  6.5  6.5  6.5  6.5  6.5  6.5	2	oroform Resultancethers	\$. O	Hydroxide Aik., as CaCO3	2
# 429 Results (mg/l)  0.5	2	. Dichioroechane . 1 -Trichloroethane			
# 429 Results (mg/l)  0.5  Hrowide  0.5  Nitrate, as N  0.5  Nitrate, as N  0.5  Nitrate, as N  0.5  Sulfate  0.5  Petroleum Hydrocarbons (mg/l)  0.5  Total Cyanides (mg/l)  0.5  Total Dissolved Solids (mg/l)  1.0  Barium, Ba  Cadmium, Cd  Chromium, Cd	6 000000000000 00000000000 00000000000	bon tetrachloride	0.0		
hromide  0.5 Fluoride  0.5 Nitrate, as N  0.5 Nitrate, as N  0.6 Nitrate, as N  Nitrate, as N  Nitrate, as N  Nitrate, as N  Sulfate  0.5 Sulfate  O.5 Petroleum Hydrocarbons (mg/l)  0.5 Total Cyanides (mg/l)  0.6 Total Dissolved Solids (mg/l)  1.0 Metal Phenols (mg/l)  1.0 Harium, Ed  Cadmium, Cd  Cadmi	6 6 6 6 6 6 6 6 7 6 7 7 8 8 8 8 8 8 8 8	bedichloromethane	o.s	429 Results (mg/l)	
Chloride  0.5  Nitrate, as N  Nitrate, as N  0.5  Chosphate, as P  0.5  Sulfate  0.5  Petroleum Hydrocarbons (mg/l)  0.5  Total Cyanides (mg/l)  0.5  Total Phenols (mg/l)  0.5  Total Dissolved Solids (mg/l)  0.6  Metal Results (wg/l)  2.0  Barium, Ba  Cadmium, Cd  Cramium, Cd	6 000000000000000000000000000000000000	:-bichiotopropane ins-1,3-Dichloropropene		Broglds	0.1
Nitrate, as N Nitrate, as N Nitrate, as N 0.5 Nitrate, as N 0.5 Sulfate 0.5 Total Cyanides (mg/l) 0.5 Total Phenols (mg/l) 0.5 Total Dissolved Solids (mg/l) 0.5 Metal Results (ug/l) 2.0 Barium, Ea Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd Cadmium, Cd C	6 00000000 00000 000000 000000 00000000 000000	chloroethene	0.5	Chloride	0.1
Nitrate, as N  0.5  Nitrate, as N  0.5  Sulfate  0.5  Petroleum Hydrocarbons (mg/l)  0.5  Total Cyanides (mg/l)  0.5  Total Phenols (mg/l)  0.6  Total Phenols (mg/l)  0.7  Total Dissolved Solids (mg/l)  1.0  Barium, Ba  Cadmium, Cd  Promium, 60000000 00000000000000000000000000000	romochloromethane	0.5	Fluoride	0.1	
Petroleum Hydrocarbons (mg/l)  0.5  0.5  0.5  Petroleum Hydrocarbons (mg/l)  0.5  0.5  Total Cyanides (mg/l)  0.0  0.5  Total Phenols (mg/l)  0.5  0.5  Total Dissolved Solids (mg/l)  1.0  Barium, Ed  Cadmium, Cd  Thromium, Cr  Leat, Ph  Silver, Ag  Mineral Kesults and H  Mineral Kesults and H  With a Ph  Mineral Kesults and H  Minera	96 000000 000000 000000 000000 000000 0000	, 2-Trichloroethane	٠.٥	Nitrate, as N	0 :
Suifate   0.5	(ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5	oroethylviny ether	0.50	Mitrite, as N Dhosphata as D	 
Total Cyanides (mg/l)   0.0	(ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5 (ug/l) 0.5	Moform	6.6	Sulfate	c . 1
Cug/l)  (ug/l)  (ug/l)  (ug/l)  (us)  (ug/l)  (us)  (u	(ug/l) 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5	,2,2-Tetrachloroethane	6.0		
Total Cyanides (mg/l) 0.0 0.5 0.5 0.5 0.5 0.5 Total Dissolved Solids (mg/l) 0.0 0.5 0.5 0.5 0.5 0.5 Metal Results (ug/l) 2.0 Barium, Ba (admium, Criteral Results (ug/l) 2.0 B	0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5	rachloroethene orobenzene	د.0 د.د	Petroleum Hydrocarbons (mg/l)	-
Total Cyanides (mg/l)  0.5  0.5  0.5  0.5  1.0  Earlun, Ba Cadmium, Cr Cramium, Cr Cr Cramium, Cr Cramium, Cr Cramium, Cr Cramium, Cr Cramium, Cr Cram	10t 0.5 10t 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5	hlorobenzenes	0.5		
Total Phenols (mg/l)  0.5  0.5  0.5  0.5  1.0  Barium, Ba Cadmium, Cd Tromium,	97.1) 0.5 0.5 0.5 0.5 0.5 0.7 0.6 0.7 0.7 0.8 0.7 0.8 0.8 0.8 0.8 0.8 0.8 0.8 0.8 0.8 0.8			Total Cyanides (mg/l)	0.005
Total Phenois (mg/l)  0.5  0.5  0.5  0.5  1.0  Barium, Ba Cadmium, Cd Thromium, Cd Thromium, Cr I read, Ph Silver, Ag  Manterni Kesuits (mg/l)  1.0  Manterni Kesuits (mg/l)  1.0  Manterni Kesuits (mg/l)  1.0  Manterni Kesuits (mg/l)  1.0  Manterni Kesuits (mg/l)  1.0  Manterni Kesuits (mg/l)  1.0  Manterni Kesuits (mg/l)  Manterni Kesuits (mg/l)  Manterni Kesuits (mg/l)  Manterni Kesuits (mg/l)  Manterni Minterni Mint	0.5 0.5 0.5 0.5 1.0 2.0 Bar Cad Char Char Char Char Char Char Char Char	8020 Results (ug/1)			
Total Dissolved Solids (mg/l)  0.5  1.0  Barium, Ba Cadmium, Cd Chromium, Cr Lead, Pb Silver, Ay  Mineral Results (mg/l)  1.1  Mineral Results (mg/l)  1.1  Mineral Results (mg/l)  1.2  Mineral Results (mg/l)  1.4  Mineral Results (mg/l)  1.5  Mineral Results (mg/l)  1.5  Mineral Results (mg/l)  1.5  Mineral Results (mg/l)  1.5  Mineral Results (mg/l)  1.5  Mineral Results (mg/l)  1.5  Mineral Results (mg/l)  1.5  Mineral Results (mg/l)  1.5  Mineral Results (mg/l)  1.5  Mineral Results (mg/l)  1.5  Mineral Results (mg/l)  1.5  Mineral Results (mg/l)  1.5  Mineral Results (mg/l)  1.5  Mineral Results (mg/l)  1.5  Mineral Results (mg/l)  1.5  Mineral Results (mg/l)  1.5  Mineral Results (mg/l)  1.5  Mineral Results (mg/l)  1.5  Mineral Results (mg/l)  1.5  Mineral Results (mg/l)  1.5  Mineral Results (mg/l)  1.5  Mineral Results (mg/l)  1.5  Mineral Results (mg/l)  1.5  Mineral Results (mg/l)  1.5  Mineral Results (mg/l)  1.5  Mineral Results (mg/l)  1.5  Mineral Results (mg/l)  1.5  Mineral Results (mg/l)  1.5  Mineral Results (mg/l)  1.5  Mineral Results (mg/l)  1.5  Mineral Results (mg/l)  1.5  Mineral Results (mg/l)  1.5  Mineral Results (mg/l)  1.5  Mineral Results (mg/l)  1.5  Mineral Results (mg/l)  1.5  Mineral Results (mg/l)  1.5  Mineral Results (mg/l)  1.5  Mineral Results (mg/l)  1.5  Mineral Results (mg/l)  1.5  Mineral Results (mg/l)  1.5  Mineral Results (mg/l)  1.5  Mineral Results (mg/l)  1.5  Mineral Results (mg/l)  1.5  Mineral Results (mg/l)  1.5  Mineral Results (mg/l)  1.5  Mineral Results (mg/l)  1.5  Mineral Results (mg/l)  1.5  Mineral Results (mg/l)  1.5  Mineral Results (mg/l)  1.5  Mineral Results (mg/l)  1.5  Mineral Results (mg/l)  1.5  Mineral Results (mg/l)  1.5  Mineral Results (mg/l)  1.5  Mineral Results (mg/l)  1.5  Mineral Results (mg/l)  1.5  Mineral Results (mg/l)  1.5  Mineral Results (mg/l)  1.5  Mineral Results (mg/l)  1.5  Mineral Results (mg/l)  1.5  Mineral Results (mg/l)  1.5  Mineral Results (mg/l)  1.5  Mineral Results (mg/l)  1.5  Mineral Results (mg/l)  1.5  Miner	0.5 0.5 0.5 1.0 2.0 Bar Cad Cad Cad Cad Cad Cad Cad Cad Cad Cad	izene orobenzene	0.5 0.5	Total Phenols (mg/1)	0.005
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## APPENDIX O

Well Surveyed Locations and Static Water Levels

1

TABLE O-1. Monitoring Well Survey Data

Northing	Easting	Measuring Point Elevation Above MSL	Well No.
		131.79	MAFB 1(1)
		130.87	MAFB 2(1)
		128.12	MAFB 2(1) MAFB 3(1)
		73.35	MAFB 7(1)
		74.70	MAFB 8\1/
		78.00	MAFB 9 ⁽¹⁾ .
		81.14	MAFB IO(1)
		80.40	MAFB 11 ⁽¹⁾
+318701.8520	+2198615.1554	39.06	MAFB 40 SPC ⁽²⁾
+318540.1192	+2198654.0814	73.16	MAFB 41 SPC
+318486.6190	+2198907.5150	74.74	MAFB 42 SPC
+319691.1421	+2199034.9053	74.97	MAFB 43 SPC
+319547.2307	+2199459.4988	75.49	MAFB 44 SPC
+319985.3504	+2200408.9127	76.94	MAFB 45 SPC
+318732.2644	+2195792.2534	68.31	MAFB 46 SPC
+323371.4433	+2195716.8172	76.53	MAFB 47 SPC
+326267.5156	+2195597.9096	75.32	MAFB 48 SPC
+330762.3108	+2198603.5253	91.47	MAFB 49 SPC
+324395.8494	+2209121.7980	123.43	MAFB 50 SPC
+324161.4741	+2209932.8752	126.35	MAFB 51 SPC
+322709.9286	+2208529.9455	122.08	MAFB 52 SPC
+323287.1250	+2207931.7169	133.43	MAFB 53 SPC
+323727.3685	+2207554.4505	117.70	MAFB 54 SPC
+318686.2202	+2198607.6178	39.19	MAFB 55 SPC
+318539.2757	+2198664.4422	73.40	MAFB 56 SPC
+318483.0342	+2198923.1022	74.38	MAFB 57 SPC
+318776.2049	+2198906.4809	74.60	MAFB 58 SPC
+318753.7210	+2195772.4498	69.10	MAFB 59 SPC
+323352.1763	+2195722.1841	76.90	MAFB 60 SPC
+324653.1127	+2195660.5754	78.13	MAFB 61 SPC
+325099.6473 +326239.7576	+2195641.1814	78.99	MAFB 62 SPC
+328423.5801	+2195593.6664	75.08 123.30	MAFB 63 SPC
+329150.8096	+2212205.1901 +2211762.6960		MAFB 64 SPC MAFB 65 SPC
+329130.8096	+2203610.2292	128.71 93.03	MAFB 66 SPC
+323699.1866	+2209141.3529	129.08	MAFB 67 SPC
+323959.7734	+2209141.3329	130.77	MAFB 68 SPC
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TABLE O-1. (con't)

		Measuring Point Elevation		
Northing	Easting	Above MSL	Well No.	
+323975.6634	+2209554.5143	133.40	MAFB 69 SPC	
+322691.4699	+2208493.7103	123.51	MAFB 70 SPC	
+323318.7865	+2207925.9875	128.22	MAFB 71 SPC	
+323756.7236	+2207543.2596	116.95	MAFB 72 SPC	
+329890.9985	+2203629.1053	92.27	MAFB 73 SPC,	
+329144.6370	+2211771.3635	127.38	MAFB 73 SPC MAFB 75 SPC	
+328435.9555	+2212192-1131	123.33	MAFB 76 SPC	

## NOTES:

⁽¹⁾ Wells drilled and surveyed during Phase II, Stage I Northing and Easting data are not available.

 $^{^{(2)}}$ Northing and Easting used to laterally locate these wells with reference to the California State Plane Coordinate System.

⁽³⁾Well MAFB-74 was not installed.

TABLE O-2. Static Water Levels

		Water Lev	vel Elevation, Ft. A	bove MSL
Well No.	Measuring Point Elevation (Ft. MSL)	Nov 86	Dec 86	Jan 8
MAFB I	131.39	26.33	19.21	20.2
MAFB 2	130.87	24.98	19.19	20.2
MAFB 3	128.12	18.15	18.49	19.6
MAFB 7*	73.35	2.42	0.08	1.1
MAFB 8	74.70	-2.04	-2.11	-0.7
MAFB 9	78.00	12.89	8.12	7.3
MAFB 10	81.14	5.85	5.71	6.1
MAFB II	80.40	5.16	4.79	4.9
MAFB 12	96.53	-~	25.19	-
MAFB 13	91.89		22.17	_
MAFB 14	92.59		**	_
MAFB 15	92.20		**	_
MAFB 16	120.04		20.43	_
MAFB 17	121.66		20.94	_
MAFB 18	119.68		20.83	_
MAFB 19	131.41		39.82	_
MAFB 20	127.06		66.81	_
MAFB 21	127.77		40.61	_
MAFB 22	137.95		33.06	•
MAFB 23	132.52		31.68	_
MAFB 24	126.67		36.44	
MAFB 25	125.34		36.97	_
MAFB 26	122.83		37.91	_
MAFB 27C	147.58		15.41	_
MAFB 28	134.79		7.41	_
MAFB 29	130.71		7.54	_
MAFB 30	133.90		8.22	_
MAFB 31	93.01	~-	20.60	_
MAFB 32	93.33		20.07	_
MAFB 33	80.81		9.39	_
MAFB 34	80.97		8.62	
MAFB 35	80.14		3.10	_
MAFB 36	81.85		8.24	
MAFB 37	78.63		5.28	_
MAFB 38	77.79		20.08	•
MAFB 39	75.03		22.09	•
MAFB 40	39.06	2 21		1 0
MAFB 41	73.16	-3.31 3.56	-2.44 2.65	-1.0
MAFB 42		-3.56	-2.65	-1.2
MAFB 42	74.74	-3.10	-2.15	-0.7
	74.97	-2.85	-1.56	-0.2
MAFB 44	75.49	26.84	26.48	25.9
MAFB 45	76.94	26.90	24.78	24.8
MAFB 46	68.31	-0.42	-0.72	-0.5

^{*}MAFB 4, 5, and 6 were replaced with wells directly upgradient from sites. These wells were not measured during Stage 3.

**Note MAFB 14 and MAFB 15 are located on runway and were not measured during

Stage 3.

TABLE O-2. (continued)

		Water Lev	vel Elevation, Ft. A	bove MSL
Well No.	Measuring Point Elevation (Ft. MSL)	Nov 86	Dec 86	Jan 87
MAFB 47	76.53	1.93	2.40	2.44
MAFB 48	75.32	7.59	5.67	6.27
MAFB 49	91.47	9.09	14.23	14.94
MAFB 50	123.43	18.94	19.46	20.57
MAFB 51	126.35	21.18	21.76	22.79
MAFB 52	122.08		14.94	16.17
MAFB 53	133.43	17.34	17.83	13.88
MAFB 54	117.70	15.67	14.74	15.86
MAFB 55	39.19	-5.70	-4.09	-2.38
MAFB 56	73.40	-6.01	-4.06	-2.46
MAFB 57	74.38	-5.59	-4.21	-2.40
MAFB 58	74.60	-5.36	-6.06	-2.17
MAFB 59	69.10	-7.37	-6.03	-4.53
MAFB 60	76.90	-5.63	-3.69	-1.72
MAFB 61	78.13	-4.50	-2.37	-0.38
MAFB 62	78.99	-4.82	-0,99	-0.92
MAFB 63	75.08	1.92	0.34	1.19
MAFB 64	123.30	21.13	21.99	23.79
MAFB 65	128.71	24.85	24.35	26.33
MAFB 66	93.03	7.94	9.64	11.57
MAFB 67	129.08	19.21	19.23	20.68
MAFB 68	130.77	19.20	18.31	20.30
MAFB 69	133.40	19.29	20.40	22.13
MAFB 70	123.51	18.98	21.78	18.08
MAFB 71	128.22	12.03	13.14	14.30
MAFB 72	116.95	14.52	15.92	17.55
MAFB 73	92.27	22.66	21.82	22.43
MAFB 75	127.38	37.96	37.92	38.49
MAFB 76	123.33	34.37	33.87	34.81

## APPENDIX P

Mather Production Wells Sampling Data 1985-1987

## Chemical Listing with Appropriate Abbreviations for Water Database

Abbreviation	Chemical
TCE	Trichlorethene
CTET	Carbon Tetrachloride
PCE	Tetrachloroethene
11DCE	1,1 Dichloroethene
11DCA	1,1 Dichloroethane
T12DCE	Trans-1,2-Dichloroethene
12DCA	1,2-Dichloroethane
IIITCA	l, l, l-Trichloroethane
1122TCA	1,1,2,2-Tetrachloroethane
CF	Chloroform
VCL	Vinyl Chloride
12DCPA	1,2 Dichloropropane
BRF	Bromoform
DBCMA	Dibromochloromethane
BDCMA	Bromodichloromethane
DCDFMA	Dichlorodifluromethane
CMA	Chloromethane
TCFMA	Trichlorofluromethane
MECL2	Methylene Chloride
C13DCPE	cis-1,3-Dichloropropene
BENZ	Benzene
CLBENZ	Chlorobenzene
TOLU	Toluene
EBENZ	Ethylbenzene

system - chanel		1-281411	MATER AFB, CA Were Holding Times Observed? YES	tuents listed
ANALYTICAL LABORATORY	PURCEABLE ORGANIC ANALYSES (Voletiles)	te of Report: 09/30/87 Lab Sample ID No. 114192-1 vorstory AMA/8 Director A. A. A. A. A. A. A. A. A. A. A. A. A.	the of SAA DEBULA (MADER AFB) Employed By: MADER AFB CA STIME Sample 3:13P West Holding Jected: 09:14-87 Received 6 Lab: 09:14-87 Times Observed	it Methods: EPA 601 below quantified? No
		te of Report	pler: -/Time /	it Metho

ANALYSES RESULTS P Y N N D D STORET 73672 Analyzing Agency Code (Lab) Intensive Survey Number Date Analyses Completed CONSTITUENT PORTING

Water [6] User [1] Submitted to SWQIS Type: 6/8 ID: By:

Latidalia titi

ce an "X" in box to delete all data for this station/date/time.

1018-11/10161E1-11/1080/1 MI

EP-s7-0416 Station Number:

System Number: 34-706

ene odjehtoromethane odern er tetrachloride

Purgeable Organic Analyses (Continued)

PAGE 2 OF 2

SYSTEM NAME & NUMBER LES

REPORTING					
	CONSTITUENT	L	STORET	AMALYSES	DETECTION
UNITS		9	CODE	RESULTS	LIMIT
nd/L	by 8-Dich loropropane		34541	O'N' TTT	1 101 1510
7/50	4e-1-3-Dichloropropene		34704		1 101 1510
	Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Section of the Sectio	Ħ	34699	GN, , , ,	1 101.1510
nd/L	Dthyl-benzene		14371	AM A A A	0151-101-1
П	methylene_chloride	Ħ	34423	D.N.	101.1510
٦			81595		131.1010
		Ξ	96518		131.1010
nd/L	the state of trachloroethane		34516	1. 1. 1. Land	0151.101
1/bn	etechloroethene (PCE)		34475	O'N'	0/5/-/0/
	-00		34030	VN.	1 101 1510
	trichloroethane		34506	Q'N'	101.1510
	The Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the Court of the C		34511		0151-101
	Loroeth		39180		1 101 1510
	menhamefluoromethane		34488	77	0 5 - 0 -
nd/L	Winnyl abloride		39175	GN, L.	0 0 0 1 1 1 1 1 0 1 0
nd/r +	dylenen.		81551	A.N.	0151:101_1
ng/L 13	The Long thanks		92080	מיונייייייייייייייייייייייייייייייייייי	0151-101-1
				11111	
				11111	
				11111	1111
				1 1 1 1	
		П		1 1 1 1	
				1.1.1.1	

Note any unidentified peaks below

not included in database but sampled for.

- 1. The report from the drinking water well database is attached. It includes the results of testing from 1985 to 1987. It is divided into three parts with each part containing the results for eight (out of 24) contaminants of interest.
- 2. WELL column identifies which well was tested using the following code:

```
FH1 - FH6 = family housing wells

FHD = family housing distribution system

MB1 - MB4 = main base wells

MBD = main base distribution system

K-9 = K-9 well

K-9D = K-9 distribution system
```

3. DATE column identifies when the sample was taken in the format YYMMDD (i.e. year year month month day day). The following applies to the dates used:

DATE	Test Lab	Tests run
841102	Anlab	601 (on new FH4 well)
85010 <b>8</b>	Radian	601, 602
850130	Radian	601 (for FH2 d1d 601,602)
850304	OEHL	601, 602
850326	McClellan	601
850603	OEHL	601
850699	Stage i lab	601, 602 (duplicates of 850603)
850627	Stage 1 lab	601, 602 (on well FH5)
85070 <b>8</b>	Calif Analytical Lab	601
850812	Calif Analytical Lab	602 (on new FH4 well)
860127	Anlab	.601
860416	Anlab	601
860624	Anlab	601
86072 <b>9</b>	OEHL (TMA/EAL)	601, 602 (repeat 602 done 870325)
860917	Anlab	601
861210	Anlab	601
861299	Stage 3 lab	601, 602 (duplicates of 861210)
870325	Anlab	601
87032 <b>5</b>	OEHL.	602 (for FHD, MBD, K-9D)
·87071 <b>6</b>	Anlab	601
870916	Anlab	601

4. The headings for the remaining eight columns identify the contaminant according to the abbreviations listed in Attachment 1. Entries in the column include the numeric value in parts per billion (ppb) or micrograms per liter (ug/L), TRACE, ND = "none detected", or "--" = not sampled.

			WELL	TEST 1	ESULTS G	urc L	(ز بن		
¢./™E_)	- DATE	TCE	CIET	PCE	11008	LLOCA	TIZOCE	12DCA	LILICH
3.51	50108	NO	ND	ИĎ	МĎ	MD	ИД	иD	N to S
::11		ND	ИD	ND	QИ	מא	ND	ND	MĐ MĐ
1 .11	GG 728	$I^{*}(\mathbb{D})$	ФИ	ND	ИD	rID	ДИ	GN	1417
Fri L	555663		ИD	ND	ФИ	ND	ND	ND	ND
7011	355699		ИD	ИD	MD	140	NĎ	מא	110
(Fi f 1	150708		ЙN	ND	ND	ND	ND	ND	ND
F-H1	りょう1 <i>コ</i> プ・		ИĎ	ИD	ND	ND .	ИП	ND	ND
FHI	350415		ND	ПD	ПИ	ND	ND	ND	ND
ंत्र)	ట్లల్లు <u>⊒</u> 4		ИD	ИD	ND	14D	140	ND	ND
FH1	360 <b>729</b> .		ND	ND	ND	ND	ND	ND	0.17
Fi-L	850917		ИĎ	ND	ND	ND	ND .	ND	140
FIH1	55 (£10		ND	ND	ND	ND	ЙN	ND	ND
FHI	051299		ИD	ND	ND	ND	ЙИ	2.8	
F.41	870325		ИD	ND	ND	ИD	ND	ND	ИD
FHT	550108		ИD	ND	ИD	ИD	<b>4</b> 11	ND	MD
FH2	850130		ND	ΝD	ND	ND	ИD	ND	ND
FH2	950304		МD	ND	ND	ND	ND	0.4	ND
FH2	850324		ND	ИD	ND	ND	ND	ND	ND
FH2	850603		ND	ND	ND	ND	ИD	ND	14D
FH2	850599		ИD	ND	ND	ND	ND	ND	ND
FH2	650708		ND	ND	ND	ND	ND	ND	MD
FH2	850127		ND	ND	ND	ND	ND	ND	0.51
FH2	840414		ND	ND	ND	ND	ИD	ND	ND
FHC	850 <b>5</b> 24		ND	ND	ИD	ND	ND	ND	ND
FH2	860729		ИD	ND	ПD	ND	ИD	ND	0.10
FH2 FHC	560917		ND	ND	ND	αи	ИD	ND	ND
FH2	8/0325 07/71/		ИD	ND	ИD	MO	ИD	ND	ИD
r ad	8T0715		ND	ND	ND	ИD	ИD	ND	ND
FH3	u/9/15 850108		ИĎ	ИО	ND	110	ND	ND	ND
43	650130		ND	ND	ND	11D	ИD	ND	ND
FH3	850304		ND	ND	ND	HD	ФИ	ND	ND
FHC	850326		ND ND	ND	ND	ND	ND	1.1	_
FHC	950603		ND	ND	ND	ND	ND	ND	ND
हिस्	850579		ND	ND ND	ND	ND	ND	ND	1.9
Fig.3	35070 <b>8</b>		ND	ND	ND NO	ND	MD	MD	140
HH3	360127		ND	ND	ND ND	MD CITA	ND	ND	ND
FH:	Sa0416		ND	ND	ND ND	ND	MD	ND	MD)
FH3	850 <b>624</b>		ND	ND	ND	MD		ND	ND
FH3	860729		ND	מא	ND ND	ND ND	ND	ND	ND
FH3	860917		ND	ND	ND	MD		ND	ND
FH3	861210 (		ND	ND	ND	מא		ND ND	14D
F-1.5	851299		ND	ND	ND	ND		ND	NU
FILE	870005		ND	ND	ND	ND		ND	ND ND
$F: \widetilde{G} \to \mathbb{R}^n$	870715 i	ND	ND	ND	ND	ND		ND	ND ND
១ម	\$70915	ND	NO	ND	ND	11D			ND
5.4	811027		ND	ND	ФИ	ND			ND
Park	J 9-312 -								
17 4	405 415 T		14D	ND	ND	L1D			ND
1 1	Bu0524 1		MD	ND	ПИ	ND			ND
D-194	500775 1	ďΡ	ND	ND	ND	MD			ND
									**

WELL THST RESULTS (purt 2 or 1)

WILL	DATE	1122TCA	CF	YCL	100064	BRF	DBCMA	BDCMA	ÖCDFN.+
1111	10103		HD	MD	ND	ND	MD	ИD	(1D
FILE			ND	14D	14D	Иħ	ND	ND	ND
111	00026		MD	ND	ND	ND	14D	ND	ND
F-1-1 1	1500 b 0 3		Ιν <b>D</b>	ND	ND	ND	IND	ND	ND
1.31	7.0599		14 <b>D</b>	ND	ND	ND	HD	IAD	MD
F+1	65010 <b>8</b>		ND	ND	ND	ND	ND	ND	ИD
÷ +1	3-0127		ND	ND	ND	ND	14D	ND	ND
FHI		ND	ND	ND	ND	ND	ND	ND	MD
F.H.1.	30624 306		ND ND	ND	ND	ND	14D	ND	QI4
FHI FHI	- 9557 <b>29</b> - 655 <b>917</b>		14D 14D	ND ND	ND ND	MD	ND .	ND	ND
Fill	301210		QI1	מא	ND D	ИĎ ИĎ	MD D	ИD 14D	ИD ПИD
1 +1	351299		ND	ND	ND	ND	MD MD	ND	ND 010
FHI	870005		ND	ND	D	ND	ND	ND	ND
PH2	850108		ND	ND	ND	QN QN	14D	מא	ND
FH2	050130		ND	ND	ND	מא	ND	ND	ND
FH2	850004		11D	ND	ND	140	ND	ND	ND
FH2	850326		TRACE	ND	ND	ND	ND	ND	ND
FH2	850a03	ND	ND	ND	ND	ND	ND	ND	ND
FH2	8506 <b>99</b>	ND	ND	ND	ND	ND	ND	ND	ND
FH2	65070 <b>8</b>	ND	ND	ND	ИD	ND	ND	ND	ND
FH2	860127	ND	ND	ND	ND	ND	ND	ND	ND
FH2	E60416	ND	ИD	ND	ND	ND	ND	ND	ИD
FH2	860624		ND	ND	ND	ND	ND	ND	ND
FH2	880729		ND	ND	ND	ND	ND	1.08	ND
E:10	こううラミブ	MD	ND	ND	ND	ND	ND	ПD	ND
FHC	8,0005	ND	ND	ИD	ИND	14D	ND	ND	ND
FH2	370715		NĎ	ND	ND	מא	ND	ND	ND
FH2	870915		ND	ND	ND	ND	ИD	ND	ND
FH3	850108	ND	ND	ND	ND	ND	מא	ND	ND
FHI	850130		ND	ND	ND	ND	ND	ND	ND
FILE	850304		ND	ND	ND	ND	ND	ND	ND
FHS	850324	ND	ND	ND	ND	ND	ND	ND	ND
FHS	850403		ND	ND	ND	ND .	ND	ND	ND
FHS	850699		ND	ND	ND	ND	ND	MD	ND
FH3 FH3	85070 <b>8</b>		ND O 31	ND	ND	ND	ND	ND	ND
FH3	860 <b>127</b> 860 <b>416</b>		0.31 ND	ND ND	ND ND	Й ДИ	ND ND	ND ND	ND D
FHS	860624		ND	ND	ND	ND	ND	ND	ND
FH3	860729		ND	ND	ND	ND	ND	ND	ND
FH3	860917		ND	ND	ND	ND	ND	ND	ND
FH3	861210	ND	ND	ND	ND	ND	ND	ND	ND
FH3	861299		ND	ND	ND	ND	ND	ND	ND
FH3	870325		ND	ND	ND	ND	ND	ND	ND
FH3	870 <b>71</b> 6		ND	ND	ND	ND	ND	ND	ND
FH3	870916		ND	ND	ND	ND	ПD	ND	ND
FH4	841102	ND	ND	ND	ND		ND	ND	ND
FH4	850812								
FH4	850416		ND	ND	ND	ND	ND	ND	ND
FH4	860524		ND	ND	ND	ND	ND	ND	ND
FH4	85072 <b>9</b>	ND	ND	ND	ND	ND	ND	ND	ND

WELL TEST RESULTS (part 5 of 5)

					•		-		
WELL	DHIE	CMA	TOFMA	MECL2	C13DCPE	BENZ	CLBENZ	TOLU	EBENI
FHI	₹5010 <b>3</b>		HD	ND	ND	1.0	ND Qu	ND	id <b>D</b>
FH1	350314		מוא	ND	MD	1417	110	ND	ND
FH1	250326	ND	NiD	ND	MD	-	- <del></del>		
FH1	JE50503	ÐΩ	140	ND	ИD				
FHI	650699	MU	ΝĎ	ИD	ND	ស្រ	MD	0.74	Sin
FH1	350708	ND	ND	ND	ND				_
FHL	080127	ND	NID	MD	14D		- <del>-</del>		
F111	080410	iiD	MD	ND	ND				
7.11	0.50534	140	ND	ND	ND				<u> </u>
17:41		tiD.	ND	0.25	ND	1417	ND	по	e4O
F1	.50917		ND	DZ 7	עוא				1947
("141	551210		ND	ДИ	ДИ				
17.11	U 1277	110	MD	ND	ND				
7711	0325		ND	ND	ND	 Мъ	14D	MD ÷−	נווו
FBZ	650108	ND		2.8					
FH2	050100		ND NO			MD	14D	14D	14D
FHQ	650304		ND	ND	ND	ND	ND	ND .	ИD
FH2	850304 850326		ND	ND	ND	ND	ND	ND	ND
FH2			ND	ND	ND				
	850403		ND	0.7					
FH2	850 <b>699</b>		ND	ND	ND	ND	ND	0.94	ND
FH2	850708	ND	ND	ND	ND				
FH2	850127		ND	ND	ND				
FH2	860416	ND	ND	ND	ND				
FH2		ИÐ	αи	ND	ND				
FH2	360729		ND	ND	ND	СИ	ND	ND	ND
FHO	260917	ND	ND	ND	MD				
T 0	770705	ND	ИD	ND	14 <b>D</b>		-		
F + +		I III	1417	ND	רזאו	-			
FHO	8~0 <b>915</b>	ND	ИD	ND	ND				
Fall	L50108	ND	MD	NÚ	NÚ	Mn	1.10	ND	تننا
FH3	850130	ИD	ND	ND	ND				
FH3	850304	ИD	ND	TRACE	ND	ND	ND	ND	ND
FH3	859326	ND	ND	ПD	ND	<del></del>	<b>-</b>		
FHI	<u>550603</u>	ND	ND	0.5	ND				
F∺©	850599	ИD	ND	ND	ND	ND	ND	0.94	14D
FH3	850708	ND	ND	ND	ND				
FH3	860127	ND	ND	ND	ND				
FHZ	860416	ИD	ND	ND	ND				
FH3	0624ع	ND	ND	ND	ND				
FH3		ND		ND	ND	ND	ND	ND	ND
FH3		ND	ND	ND	ND				
					ND				
	861299						NITY		ND.
	87032 <b>5</b>	ND			ND	ND 	ND 	ND 	ND
FH3	870716	ND			ND				
					ND				
	850812			 UND	ND		 ND	ALD.	NITS
								ND	ND -
					ND ND				
	850729								
		176	IND	ND	ND	ИD	ND	ND	ND

DOLL HEST RESULTS (part 5 or 1)

Will .	per HI	ÚMÁ	I CFMA	MECLO	C1 SDCF (S	DENI	CLBENZ	roLu	EBENI
i-141	49193		HĐ	ИĎ	аи	1.0		ND	: ID
Flai	. IDO 51.4		iΨĎ	MD	111)	140	HD	ИD	ND
Fai	111 20		1.10	ИĎ	ИĎ			<del></del>	
Fit1	190500		NÜ	ND	ИD				
11	17.03.557		110	11D	11D	Hu	14D	0.24	
동범1	7.0703		MO	ND	ND	• .		<del>-</del>	-
EH1	2501.27		<b>d</b> .1	ИD	ND	**	· <del>-</del>		
F114	1300		1.10	ИD	MD				
;=;	0.50504		HD	ИΩ	14 <b>D</b>	·- <del>-</del>		·- •	•
17.44	7720		14D	0.26	MD	1417	HD.	NO	citte
F !	.0947		110	1410	MU	~ ·	· ••		· <del>-</del>
: 111	$\sim 1.240$		MD	ИD	ND	~ .	- ·-		
7 . i <b>t</b>	44-41222		l+D	140	HD	MU	140	ND	ΙΙŪ
1111			ND	ИD	MD	•		<u>-</u>	
لسانات.	801083		0.4	2.8		ИО	141)	14D	14D
FHE	050430		110	ND	ND	ND	MD	ND	14D
FH2	650004		la D	ИD	ИD	ИD	ИD	ND	ИD
FH2	1550226		ND	ND	ND				
FH2	850803		МD	0.7					
FH2	850 <b>699</b>		ИD	ND	ПD	ND	ND	0.94	ИD
FH2	850708		14D	ND	ND	~-			
FH2	860127		מוא	ND	ND	~-			
FH2	860416		CI1	ND	ND				
FH2	860624		ИD	ND	ND	-			<del>-</del>
FH2	860729		ND	ИD	ND	ND	ND	ND	110
FHO	850917		ND	ND	ND				·
FHO	8703 <b>25</b>		ND	ND	ND		<del>-</del>		
FH2	870715		ND	ND	ND	70			
FH2		ND	MD	ND	ND				
FHI	050108		ИD	ND	ND	ИD	ИD	ND	MD
១៨៤	E50130		MD.	ND	ИĎ		<del></del>		
F.H3	850304		ND	TRACE	ND	ЙĎ	ND	ND	ND
FH3	850324		ND	ND	ND				
FH3	850603		ND	0.5					
F. (3	850579		ND	ND	ND	MD	ND	0.94	
FH3	850708		ND	ND	ND				
FH3	860127		ND	ND	ND				~-
FHS	860416	ND	ND	ND	ND				
FH3	850624	ND	ND	ND	ND				
FH3	860729		ND	ND	ND	ND	ND	ND	ИD
FH3	860917	ND	ND	ND	ND				
FH3	861210	ND	ND	ND	ND				
FH3	861299	ND	ND	ND	ND	ND	ND	ND 	ND
FH3 FH3	870325	ND	ND	ND	ND				
FH3	870716		ND	ND	ND				
FH3	870916	ND	ND	ND	ND				
FH4	841102	ND 	ND 	ND 	ND		ND	ND	ND
FH4 FH4	850812 860416	ND	ND	ND	ND	ND		ND 	
FH4	360624	ND	ND	ND	ND				
FH4	860729		מא	ND	ND	ND	ND	ND	ND
1 11-T	www.y			. 75	. 42	.45		, , ,	

WELL TEST RESULTS (punt 2 or 7)

WCLL.	WATE	1122FCA	cr	VCL	12DCFA	LustF	UECNA	AMODB	DODEME
i *, <del>1</del> -+	∴ ∴509 <b>1</b> 7	ЫD	L1D	ND	ND	ن ۱ ۱	14D	[VD]	L.C.
[ [H-]	351210		ИО	ND	ND	140	NĎ	ND	l∓Ď taĎ
177-1-4	Ge 1299		11D	ND	HÜ	NO	ND	ND ND	14D
1 1 !-	01/03/25		ND	I4D	ND	NU	QM	ND	HD HD
	87976		14Đ	ND	ND	M7.	I ₄ D	ND	HD
17114	570715		14D	ND	ND	(11)	14D	ND	מא
FB5	650108		11D	ND	14D	140	ND	ND	ND ND
61(5	350004		24.5		ND	עֿעו	ND	ရော	
1 45	359326		MD	ND	ND	ΝĎ	14D	14D	HD
FH5	U50327		ND	ND	ND	ON	NÜ	110	ND
1714 <u>5</u>	35076 <b>3</b>		7.5		ND	ND	14D ,	ND	מוז
F1:5	300415	ЫĎ	ND	ND	ND	ND	I I D	14D	מוז
본문들	850624		an	ND	ND	MD	НD	ND	14D
FHS	S507 <b>29</b>		0.37		ND	ND	NŪ	ND	ND
FH5	050917		ИD	ND	ND	HD	ND	140	ND
FH5	851210	ND	HD	ND	ND	ND	ND	ND	ND
FH5	851299		ND	ND	ND	ND	MD	ND	ND
FH5	870005		ND	ND	ND	NĎ	ND	ND	ND
Ea5	870715		ND	ND	ND	ND	14 <b>D</b>	ND	14D
FHS	870915		ND	ND	ND	ND	UD	ND	ND
	850108		ND	ND		ND	ND	ND	ND
FHS	350304		ND	ND	ND	ND	ND	ND	ND
i Нъ	850328		ND	ND	14D	מא	14D	ND	ND
FHS	850603		TRACE	ND	ND	NU	ND	ND	ND
FHo	850599		ND	ND		ND	14D	ND	11 <u>D</u>
FHo	850708			ND		ND	ND	ND	ND
Filis	650127		ND	ND	ND	ND	ND	ND	14D
	7 6414		#1D	FID	5175	IND I I	-		140
Filo	360 <b>5</b> 24		ND	ND	ND	ND	ND	ND	 DN
FH5	850729			ND	ND	ND	ND	ND	ND
FHa	880917		ND	ND	ND	ND	ND	ND	MD
ريان ج	001210			ИD		NL	ND	ND	ND
FHó	861299			ND		ND	ND	ND	14D
FHS	870025			ND		ND	ND	ND	ND
	870716			ND		ND	ND	ND	110
FH6	870916			ND		ND	מא	ND	ND
FHD	850324		1.23		, ND	TRACE	1.15	0.97	
FHD	86072 <b>9</b>		6.02		ND	0.37	1.41	3.40	ND
FHD	870325			:					
K-9	85010 <b>9</b>		ND	ND	ND	ND -	ND	ND	ND
K-9	850304	ND	ND	ND	ND	ND	ND	ND	ND
K-7	850326		ND	ND :	. ND	ND	ND	ND	ND
	850403		ИD	מא	ND	ИD	ND	ND	ND
	850708			ND	ФИ	ND	ND	ND	ND
K-9	860127			ND	ND	ND	ND	ND	ND
	860416			ND	ND	ND	ND	ND	ND
K-9	860624		ND	ND	ND	ND	.ND	ND	ND
	860729		ND	ND .	ND	` מא	ND	ND	ND
	860917			ND	ND	ИD	ND	ПD	ND
	851210			ПD		ND	ND	ND	П
K-9	851299	ND	<b>0.</b> 7	ND	ND	ИD	ND	ND	ND

## WELL TEST RESULTS (pant 1 of 1)

MOLL	- SATE	CMA	TOFMA	MECL2	C13DQPE	6/3/4/3	CLBENZ	TOLU	EBENI
F.:14	: 60917	' ND	ND	NĎ	ИĎ		: <del></del>		4
F114	10100 دا	ND	ND	ND	MD				
F114	1-51299	ND	MD	ND	MD	145	140	ND	MD
F1++	070025	14D	ND	QN	ND				110
ति। <del>।।</del>	87071s	$\Gamma_i D$	'UV1	ND	MD	mm			
FH4	070916	1:10	ИĎ	ND	ND				
FHS	U50108	14 <b>D</b>	5.1	MD	ND	1410	14D	140	14D
1145	550 <i>3</i> 04		ND	ND	NÚ	ND	14D	ND	14D
FH5	85032 <b>5</b>		ND	ND	140		~-		
EHS	35 %27	ND	ND	ND	ND	Hē	14D	0.50	
First	85070 <b>8</b>		ND	ND	ND			V. OV	
FHS	ປິສປ415	HD.	ND	ND	ND				
$\mathbf{r}^{2}$ . $\mathbf{r}^{2}$ .	กระกร24		МD	ND	ND			<del>-</del> -	
Fire	08 772 <b>9</b>	NŪ	ND	ND	ND	MD.	11D	ND	ND
FH:5	330917	ND	MD	ND	ND				
FH5	861210	MD	14D	ND	ND				
EH5	851299	ND	MD	ND	ND	140	14 <b>D</b>	ND	14D
FHS	870325	HD	ND	ND	ND				
FH5	870716	ND	ND	ND	ND	<b></b>			
FH5	870915	11D	ND	ND	ND				
FHÓ	850108	ND	ND	ND	ND	2.3	7 ND	ND	ND
FHS	850704	MD	CM	ND	ND	ND	ND	ДИ	ND
FHo	850326		ND Did	ND	ND				
FH5	850603	ND	DI-1	0.3	ND				
Filo	らうりもクタ	ND	ΜD	ND	ND	MD	ND	0.74	tu Ci
FHS	650708	14D	ND	ND	ND				
F 14.5	850127	شدا	14 <b>D</b>	ND	ND				
F	- 415	HÜ	Q14	MD	ND				
Fitte	1.500524	14Ď	ИD	ND	ND				
FHO	889729	14D	ND	ND	ND	ND	МD	ND	ND
11110	E 20917	F4D	mΰ	ND	NĎ				
FH5	851210	พบ	ND	ND	ND				
Filó	851299	ND	ND	ΩИ	ND	ND	110	ND	14D
FH3	870325	MD	ПD	ND	ND				
FH6	870715		ND	ND	ND				
FH6	870916		ИD	ND	αи				
FHD	850326		ND	ND	ИD				
FHD	8607 <b>29</b>	ND	ND	0.28	ND	1.11	ND	ND	ND
l≘H <b>D</b>	870325					14D	ND	ND	ND
K-9	850109	ND	ND	ND		ND	ND	ND	ND
K9	850304	ND	ND	TRACE		ND	ND	ND	ND
ピータ	850324		ND	ND	ND				
F 9	850603		ND	0.2	ND				
K - ' <b>?</b>	850708		ND	ND	ND				
K-9	860127	ND		ND	ИD				
K-9		ND	ND	ND	ND				
K-9	850624			ND	ND				
K-9	860729		ND	0.27		ND	ND	ND	ND
k9	860917			ND	ND				
r(-17	851210			ND	ND				
K-9	851299	ND	ND	ND	ND	ND	ND	ND	ND

WELL TEST RESULTS (part 1 of 1)

HELL	DATE	TCE	CTET	P'CE	110CE	110CA	TIEDCE	12DCA	111TCA
F(~9)	870325	ND	ND	ND	ND	ND	ND	ЙD	ND
je 67	870715		ND	ND	ND	ND	QИ	ND	ND
119	870 <b>91</b> 6		ND	ND	ND	ND	ND	ND	ND
K-9D			ND	ND	ND	ND	ИD	ND	ND
11-9D	350729		ND	ND	ND	ND	ND	ND	ИD
	970325								
MB1	850108		ND	ND	ND	ND	ND	ND	ИĎ
MB1	850130		ND	ND	ND	ND	ND	ND	ND
MB1	250304		ND	ND	ND	ND	ND	ND	ND
MB1	350324		ND	ND	ND	ND	ND	ND	ND
MB1	850403		ND	ND	ND	ND	ND .	ND	ND
MS1	050499		ND	DI	ND	ND	an	ND	110
MB1	850708		ND	ND	מאו	ND	ND	ND	ND
MOI	850127		ND	ND	ND	מא	ND	מא	ND
#81	850415		מא	ND	ND	מא	ND	ND	ND
MS1	850524		ND	ND	ND	מא	ND	ND	ND
						ND		מא	ND
MBI	850729		ND	ND	ND		ND		ND
MB1	840917		ND	ND	ND	ND	ND	ND	
MBI	851210		ND	ND	ND	ND	ND	ND	ND
MB1	861299		ND	ND	ND	ND	ND	ND	ND
MB1	870325		ND	ND	ND	ND	ND	ND	ND
MB1	970716		ND	ND	ND	ND	ND	ND	ND
H81	670913		ND	ND	MD	ND	ND	ND	ND
MBZ	850108		ND	ND	ND	NO	ND	ND	ND
M82	850304		ND	ND	ND	ND	ND	ND	ND
MBZ	850324		ND	ND	ND	ND	ND	ND	ND
M50	550603		ND	ND	ND	MD	ND	ND	MD
MB2	850699		ND	ND	ND	ND	ND	ND	ND
1182	850708		iνD	ND	ND	ИD	ND	ND	ND
MBZ	880729		ND	ND	ND	ND		. ND	ND
HR2	550 <b>917</b>		ND	ND	ND	ND	ND	ND	ND
MB2	870914		ND	ND	ND	ND	ND	ND	ND
MBS	850108		ND	ND	ND	ND	ND	ND	ND
MBI	850130		ND	ND	ND	ND .	ND '	ND	ND
MBC	950704		ND	ND	เกบ	rti)	, 14,	• •	* 1 <del>**</del> * * * * * * * * * * * * * * * * *
MBI	850324		מא	ND	ND	110	HD	ND	HŪ
MB3	850603		ND	ND	ND	ND	ND	ND	ND
MB3	8506 <b>99</b>		ND	ND	ND	ND	ND	DD	ND
MBJ	85070 <b>8</b>		ND	ND	ND	ПD	ND	ND	ND
MBC	860127		ND	ND	ND	ND	ND	ND	ND
MB3	860416	ND	ND	ND	ND	ND .	ND	ИD	ND
MB3	860624	ND	ND	ND	מא	ND .	ND	ND	ND
MB3	860729	ND	ND	ND	ND	ND	ND	ND	ND
MB3.	860917	מא	ND ·	ND	ND	ND	ND	ND	ND
MB3	870716	ND	ND	ИD	ПD	ND	ND	ND	ND
MB3	870915		ND	ND	ND	ND	ND	ND	ND
MB4	850108	ND	ND	ND	ND	ND	ND	ND	ND
MB4	850130		ND	ND	ND	ND	ND	ND	ND ·
ME4	850304		2.2		ND	ND	ND	3.7	
MB4	850324		ND	ND	ND	ND	ND	ND	ND
MB4	850503		ND	ND	ND	ND	ND	ND	ND

Toget inc.

### WELL TEST RESULTS (part 2 of 3)

WELL.	CATE	1122TCA	CF	VCL	12DCFA	DINF	DBCMA	BDCMA	DODEMA
1 -49	579305	ND	ир	ND	ND	14D	ND	ND	ИĎ
k -9	370715		ND	ND	עוו	ND	ND	ПD	ИD
1 -9	5/0916		14D	ND	ND	ии	ND	ND	ND
	850025		ND	MD	ND	ND	ND	ND	ND
	860720		2.03	ИD	ND	ИD	0.54	1.22	11D
	670325					<del></del> ,		****	
14E 1	650108		ИD	ND	ND	ND	ИD	ИĎ	MD
PHS L	855170		2.2	ND	ИD	ND	ND	ND	ND
PIB 1	£50304	ND	1.3	ND	ИD	GИ	ИD	ND	14D
MB1	050326		ND	ND	ND	ИD	ND .	ND	ND
11£1	E 30 <b>5</b> 03	NΩ	ИD	ND	ND	ИD	ND	ФИ	ND
MO1	85059 <b>9</b>	ND	ND	ND	ND	ND	ND	ND	14D
MB1	650708	140	MD	ИD	ND	ND	ИD	ND	14D
MB1	850427	ND QF:	П	ND	ИD	ND	ND	ИD	ND
in O.I	000416		ИD	ND	MD	ND	ND	ИĎ	ИD
31	850624		ND	ND	ND	ND	ND	ФИ	ИD
#B1	850729		ПO	MD	ND	ND	ИD	ИD	ND
MO1	850917		ND	ND	ND	ND	ND	ND	ДN
MB1	£51210		ND	ND	ND	ND	ND	ND	ND -
MB1	861299		ND	ДИ	ND	ND	ND	ND	ND
MIS 1	870525		ND	ND	ND	ND	ND	ND	ND
MLi	970716		ND	ND	ИD	ИD	ND	ND	ND
1181	870915		ND	ND	ND	ND	ND	ND	ИD
Misil	850108		ND	ND	ND	ИĎ	ND	ND	ND
MB2	850304			ND	ND	ND	ND	ND	MD
ME/2	850324		ND	ND	ND	ND	ND	ND	ND
1482	850603		ND	ND	ND	14 <b>D</b>	ND	ND	MD
MAC	650599		ND	ND	ND	ND	MD	ND	ND
H82	S50708		ND	ND	ND	ИD	MD	ND	ИD
Mesti:	SSUT 29		ND	ND	ИD	ND	ND	ND	ND
ME2	880917		ND	ND	ND	ND	ND	ND	ИD
MB2	870915		ND	ND	ND	ND	ND	ND	ND
BBS	850108		ND	ND	ND	ND	ND	ND	MD
MBI	850170	ИD	ND	ND	ND	ND	ND	ND	ЙИ
MB3	850304	ND	1.2	ND .	ND	ND	ИD	ND	ND
MBS	850324	ND	ND	ND	ИD	ND	ND	ПD	ND
MBS	820603	ND	ND	αи	ND	ND	ND	ИD	ND
MB3	850699		ND	ND	ND	ND	ND	ND	ND
MB3	650 <b>708</b>	ND	ND	ND	ИD	ND	ND	ND	ND
MBJ	860127	ND	ND	ND	ND	СИ	ИD	ND	ND
MB3	860416	ND	ND	ND	ND	ND	ND	ND	ND
MB3	860624	ND	ND	ND	ND	ND	ND	ND	ND
1183	850729	ND	ND	ND	ND	ИD	ND	ND	ND
MB3	860917	ND	ND	ND	ND	ND	ND	ND	ND
MB3	870716	ND	ND	ND	ND	ND	ND	ND	ND
MBS	870915		ND	ND	ND	ND	ND	ND	ND
MB4	850108		ND	ND	ФИ	ND	<b>D</b>	ND	ND
MB4	850130		ND	ND	ND	ND	ND	ND	ND
MB4	850304		1.5	ND	ND	מא	ND	ND	ND
MB4	850324		ND	ND	ND	ND	ND	ND .	ND
ME4	850403		ND	ND	ИD	ND	QИ	ИD	αи

# WELL TEST RESULTS (part 3 of 1)

WEL	l som	i mu	"F (7) = 1.4.0		•				
VIII C.	k. Mmil	E CMA	TCFMA	MECL2	CICDOR	BENZ	CLBENZ	TOLU	EBENZ
149			MD	ND	ИD	** -=			
₩ <b>-</b> 9			ПU	ND	ND				
K-9			. ND	ND -	QИ				
15-91			ÜИ	ND	ND				
長 - 学)		9 ND	ND	NÐ	ND	0.76	ND	MD	
((~요)						ND.	MD	ND	ND ND
HBI	650108	3 ND	ND	4.9	ND	ND	ND		ND
HB1	<b>95013</b> 0	O NO	ND	ND	ND			ND 	ND
181	550 <u>3</u> 04	AND F	ND		ND	14D	ND		
MBI	650328	ON 6	ND	ND	ND			ND 	14 <b>D</b>
MB1	850603	: ND	ND	ND	ND				
MB1	<b><i><u>850699</u></i></b>	ND	ND	ND	ND	ND	ND	~-	
Met	850708		ND	ND	ND			2.0	
MB1	860127		ND	ND	ND				
MAL	560415		ND	ND	ND				·- ·-
ME:1	950524		ND	ND	מא				
MB1	850729		7 ND	0.42		ND			
MB1	860917		ND	ND	ND		ND	ND	ND
M81	361210		аи	ND	ND				
MB1	851299		ND	ND	ND	ND			
MB1	870325		D	ND	ND	ND ~-	ND	ND	ND
MB1	870715		ND	ND					
MB1	870916		ND	ND	ND				
MB2	850108		ND	D	ND		- <del>-</del>		
MB2	850304		D GIA		ND	ND	DU	ND	ND
MB2	850325		מא	2.9		ND	ND	ND	ND
MBC	850403			ND	ND				
MB2	\$50 <b>5</b> 99		ND	ND	ND				
MBC			ND	ND	ND	ND	ND	0.84	ND
MG1			ND	ND	ND				
17140 m	C60729		ND	ND	ND	ND	ND	ND	ND
		1.D	ND	ND	ND				
HEE MOT	3 0916		ND	ND	ND	- <b>-</b>			
MB3	850108		ND	ND	ND	3.0	ND	ND -	ND
MB3	850130		ND	ND	ND				
MBI	850304		ND	2.8	ND	ND	ND	ND	ND
MB3	850326		ND	ND	ND				
MB3	850603		ND	ND	ND				
MBG	\$50599		ND	ND	ND	ND	ND .	ND	0.35
MBS	850708		ND	ND	ND				
MBZ	840127		ND	ND	ND				
MB3	860416		ND		ND			<b>-</b> _	
MBC	850524		ND		ND				
MB3	850729		ND		ND	ND		ND	ND
MB3	860917		ND		ND				
MB3	870716		ND		ND				
1183	870916		ND		ND		,		
MB4	850108		ND		ND	4.0			ND
MB4	850130		ND		ND	····			~
MB4	850304		ND	2.7					ND
MB4	850326				ND		,		
M84	850603	ND	ND		ND				
							_	-	

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WELL TEST RESULTS (part 1 o) 3)

WELL.	DATE	TOC	CTET	PCE	11DCE	110CA	TIEDCE	10000	
MITTELL.	DHIE	1 C. E.	CIEI	FCE	TIDGE	TIDCH	TIEDUE	LADOR	111 FC(-)
1484	050699	ND	ND	ИD	ир	MD	ИD	ND	ИD
MB4	35070 <b>8</b>	ИD	ND	ND	ND	ND	ДИ	ND	ND
MSA	880729	ND	ND	ND	ND	ФИ	ИD	ND	ND
MB4	360917	MD	ND	ND	ND	ИÐ	ИD	ND	ND
MB4	861210	ND	ND	ND	ИD	ND	ИĎ	ND	ND
MO4	851299	NO	מא	ND	ФИ	ND	ND	ND	ND
MB4	870325	ND	ND	ND	ND	ND	ND	ND	ND
MB4	870716	ФИ	ND	ND	ND	ДИ	ИD	ND	11D
MB4	870916	ИD	ПD	ND	ND	ND	ND	ND	ND
MBD	350324	ND	TRACE	ND	ND	ND	ND	ND	ND
MED	860729	ND	ПD	ИD	ND	ND	ND .	ИD	ND
M20	970325					-÷			

#### WELL TEST RESULTS (part 2 o: 3)

UNILL	DATE	1122TCA	CF	VCL	1200PH	BRF	DECMA	BDCMA	DCDFMA
H34	250a9 <b>9</b>	ND	ND	ИД	ND	MD	T1D	ND	ИD
111114	::::::::::::::::::::::::::::::::::::::	ND	ND	ЦИ	ЙИ	ND	ND	ИD	ND
相母母	E 072 <b>9</b>	ND	0.20	ПD	ND	MD	U11	ND	ND
图34	850017	ПD	ND	ND	ND	ND	MΩ	ND	ИD
M84	351210	†-ID	ND	ИΩ	NĐ	NĎ	ЫD	140	ИD
1464	031299	MD	MD	ND	αи	ND,	ПD	ND	ND
M3-4	U703 <b>25</b>	ND	11D	ND	ИD	ND	ND	ND	ND
140.4	8/0716	iнD	ND	ND	ND	ЙÜ	QI4	ND	11D
1434	0.70916	ND	ИÐ	ND	ND	MD	ЫD	11D	ND
1080	05/0326	11D	TRACE	ND	ND	พษ	TRACE	TRACE	14D
HED	1856) 7 <b>29</b>	ND	2.52	QИ	ИÐ	MD	0.42	1.09	ND
HED	370325								

### WELL TEST RESULTS (part 3 of 3)

HELL	DATE	CMA	TCFMA	MECL2	CICDOFE	BENZ	CLEENZ	TOLU	EBENZ
2021	(15%),5 <b>₹9</b>	CHA	ND	ИD	ии	140	ИД	1.9	MD
MS 4	050708	—	ND	ND	ND ND				
MEA	850729		. ND	ND	ND	ND	ДИ	ND	14 <b>D</b>
出版4	Sa0917	ND	ND	ND	ND				
(4 <b>9</b> 4	361210	MD	ИD	ND	ND				
1454	33129 <b>9</b>	14D	ND	ND	ND	ND.	ФИ	ūИ	ND
1484	070325	ND	ND	ND	ND				
MB4	870715	ND	ПD	ND	ND				
1464	370915	ND	IND	ND	ND				
riBD	850026	ND	ND	ND	ND				
MUD	680729	ND	ИD	ND	ИD	ND	ND.	ND	ND
MDD	870525					ND	ND	ND	ND

APPENDIX Q

Soil Gas Data

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Job Aerovironment - Mather AFB - Sacremento, CA

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TRACER RESEARCH CORPORATION

mean ug/l concentrati mean ug'l concentration normana ao 17gin maa CONDENSED DATA mean 11g/1 concentration Page 0.005 TCE 0.005 0.005 depth date 7/6 7/6 9/2 $\frac{7}{6}$ 3.54 TEVALENTSO Date ٢^ . 7 . 7 State of E S SGM2 SGM3 SC344

0.000

7/6

4

SGM5

	ç											
0.006	0.007	0.003	0.007	0.005	0,003	0.005	. 0.002					
9/2	9/2	9/2	9/2	9/2	9,2	9/2	6/5					
51	12	.~	2.5	ت.	-	-						
SGMo	SGM7	SCMS	SCN9	SCMO	SCMT	StM12	× IW'X					

Solutions: Plinesponse factor Linterference with adjacent peaks

.3 not analyzed estimated peak area

Checked by: M. Krotenberg

K. Tolman

Summarized by:

Proofed by: Laplander

Aerovironment - Mather AFB - Sacremento, CA **a**)

Date

THACER RESEARCH CORPORATION

mean ug/l concentration mean ug/l concentration K. Tolman Summarized by: mean ug/l concentration CONDENSED DATA mean ug/l concentration 0.0002 0.0008 0,0003 7000.0 0.0002 0.0002 0.0005 900000 0.0004 0.0005 0,0002 0,0003 1000.02 0.0005 <0.0001 0.0002 <0.0001 date 8./6 9/3 6/3 17.3 8/6 1/6 5 9/3 8/6 8/3 6/3 6/3 9/3 6/3 9/3 6/3 6/3 depth 4.5 CONTAMINANT --~ **,** †7 ----7 - 4 <del>.</del>~ • • -<u>-</u>, . 7 ر. SCN28 (1. KD) SINIS 97KJS SGM27 SGM16 SCM19 5 i duries SC3014 SCM15 SGM17 SGM18 SCM20 57M55 SCM10 SCM23 SGM21 SGM22

Not at Fous:

response factor

interference with adjacent peaks not analyzed ÷ - ×

M. Krotenberg Checked by:

Pronted by:

L. Japlander

CONDENSED DATA

Page

Date

THACER RESEARCH CORPORATION

क्षात्वम पष्ट्र/। र जार एमर त्या र उस 0.0003 0.0002 0.004 0.0004 0.002 0.0003 PCE 0.0003 0.0002 0.0005 mean ug/l concentration 0.0005 0.0002 0.0004 0.0004 0.002 0.0000 0.0003 0.007 100.0 0.000.0 mean ug/l concentration 0.0000 0.000 1.0007 0.007 0.000 0.0001 0.007 1.1.1-TCA 6(11)()*() 0.000 mean ng/l concentration F-113 0.004 0.004 date 7/6 7/6 6/6 0/4 9/4 7/6 7/6 7/6 7/6 7/6 depth CONTANINANI --------۲, ţ__ .7. - 47 ---a dinies SGLT5 9.5% X.(5) 67135 SG1.2 801.3 50174 501.5 SG1.7 561.1

interference with adjacent peaks response factor - × <u>-</u> Not at 1 ons:

not analyzed

Summarized by:

Y. Krotenberg Checked by:

K. Tolman

J. Liplander Proofed by: TRACER RESEARCH CORPORATION

Date

CONDENSED DATA

PCE	Rentration mean ugal concentration.	7()(	104	10.3	101	002	100	X17	0.001	003	003	). (1)	004	10).				
	mean ug/l concentration	7000.0	5000*0	0.0003	0.0001	0,0002	0.0001	0,00007	0.0	0.0003	0.0003	0,0004	0.0004	0.0001				
1.(1)	n ug/l concent	600.0	600*0	0.002	0,002	<0.00007	0,002	0.002	100.0	× 0002	0.(02%)	0.004	(**)	100,*0				
1,1,1 TCA		0,002	0.002	0.001	0,001	0,001	0,002	100*0	0.0008	0,002	0,001	0,002	0,001	I ()()*()				
,	gate	9/5	9/5	9/5	9/5	9/5	5/6	9/5	9/5	9/5	9/6	9/5	5/6	5/6				
MINAMI	depth gate	5,	3.	3.1	5.7	5,	2.	• · ·		٠,	5.5'	٢.	÷.	1.77				
TRANIMATMOD	o jalmus.	OS NOS	SGM31	SGM32	SGM33	SGM 34	SCM35	SCM36	SGM37	SCM38	SCM30	SGN40	SGM41	24K08				

Not at ions:

response factor interference with adjacent peaks not analyzed ... - ×

k. Tolman Summarized by: M. Krotenberg Checked by:

L. Laplander Proofed by:

TRACER RESEARCH CORPORATION

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Date

CONDENSED DATA

		mean ug/l concentration																:	•
	PCE	mean ug/l concentration	0,0003	0.0003	0,0002	1000*()	0,0002	0.0003										ed by: K. Tolman.	
L TOTAL GUENALONS	E	mean ug/l concentration		6)()()*()	6000,0	.0000	<0.0001	1000.0			A. S. S. S.	* 1						Summarized by:	א דונה עינה
	1,1,1 TCA	mean ug/l concentration	0,002	0,0002	0,0007	0,0002	0,0004	60000.0>		-								tor with adjacent	not anatyzed
		date	9/6	9/6	9/6	9/6	9/6	9/6	9/6									<u> </u>	
1	CONTANINANT	Depth	2.	5.	34	4,	2	21										ions:	
	VINO	Sample	SGM43	SGN44	SGM45	95WDS	SGN47	SCM48										Not at ions:	

1. Inplander

Properties by:

